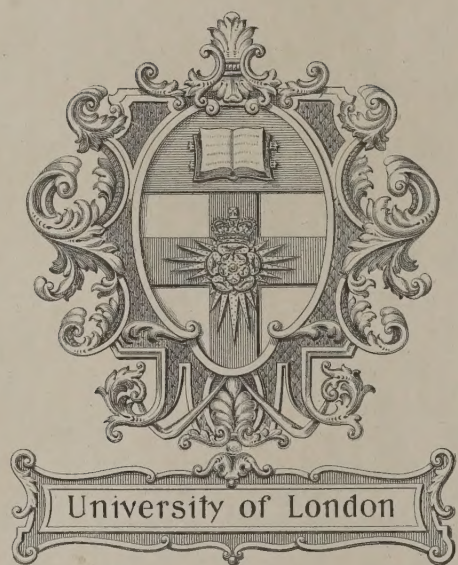
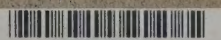






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ACCOUNTS AND PAPERS:

THIRTY-FIVE VOLUMES.

—(11.)—

EAST INDIA—*continued.*

EDUCATION; ELECTRIC TELEGRAPHS;
EMPLOYMENT OF NATIVES;
ENGINEERS' ESTABLISHMENT; IRRIGATION;
LADAKH; OUDE; PROGRESS AND CONDITION.

Session

19 November 1867 — 31 July 1868.

VOL. L.

ACCOUNTS AND PAPERS:

OF THE

—(11)—

LAST INDIA—

REVENUE & FINANCIAL ACCOUNTS;
GENERAL & SPECIAL;
AND OTHER ACCOUNTS, INCLUDING
REVENUE, EXPENDITURE, AND COMMISSION.

—(12)—

IN NINETEEN HUNDRED AND ONE.

VOL. I.

ACCOUNTS AND PAPERS:

1867-8.

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EAST INDIA (EDUCATION).

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“COPY of REPORT by Sir *A. Grant*, Director of Public Instruction at *Bombay*,
on the NOTE of Mr. *A. Monteath* on the State of EDUCATION in *India*.”

NOTE.—Mr. Monteath's Note, referred to in the above Return, is annexed.

India Office, } H. L. ANDERSON,
30 April 1868. } Secretary in the Educational Department.

(*Sir Stafford Northcote.*)

Ordered, by The House of Commons, to be Printed,
4 May 1868.

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COPY of REPORT by Sir A. Grant, Director of Public Instruction at Bombay, on the NOTE of Mr. A. Monteath on the State of EDUCATION in India.

(No. 2552 of 1867-68.)

To C. Gonne, Esq., Secretary to Government, Educational Department,
Bombay.

Poona, Office of Director of Public Instruction,
Sir, 9 December 1867.

IN reference to your letter, No. 390, dated 13th July last, I have the honour to submit, for the information of Government, the following remarks, which a careful examination of Mr. Monteath's "Note on the State of Education in India in 1865-66," have suggested to me :

2. I would first beg to point out the omission from this "Note" of all mention of educational "standards." In England, the annual Educational Returns state the number of children throughout the inspected schools who have passed respectively under the different standards laid down by the Committee of Council. And in this Presidency all Governmental and aided schools are examined under prescribed standards, and a definite notion of the instruction imparted can always be obtained by reference to the Inspector's tables of passed pupils. In other Presidencies these precise *data* are wanting, but still Mr. Monteath might, I humbly think, have aimed at giving the reader some information as to the instruction really imparted in different classes of schools. For instance (paragraph 174), what is it that the masters of Hulkabundee Schools, with their wretched salaries of three rupees to five rupees per mensem, are expected to teach? Of the 155,255 pupils in lower class schools of the North Western Provinces (paragraph 173), how many can read or write? how many would pass in the first four simple rules of arithmetic? Again (paragraph 158), what are the qualifications which entitle a Guru, according to the Patsiala system of Bengal, to receive a certificate? Such are the questions which Mr. Monteath's "Note" constantly suggests and leaves unanswered.

3. Besides the above-mentioned defect in the *form* of the "Note" (which gives educational statistics without standards), I have been impressed with a sense of inequality in the matter of the information conveyed. Mr. Monteath is probably acquainted with the educational system in Bengal, but with that of Bombay his acquaintance must be imperfect. I notice that Mr. Monteath adopts the following order of arrangement for the eight Presidencies and Provinces having organised departments of education :—1st, Bengal; 2nd, North Western Provinces; 3rd, Panjaub; 4th, Madras; 5th, Bombay; 6th, Oude; 7th, Central Provinces; 8th, Mysore. Now, this order probably corresponds with the order of precedence which the different educational departments hold in Mr. Monteath's mind, according to his knowledge of them, and interest in them respectively; but there is no other apparent reason to justify such an arrangement. It is hard to see why Provinces should stand before Presidencies, or why Madras and Bombay, which contain universities, should rank educationally below the North Western Provinces and Panjaub, which do not.

4. When Mr. Monteath comes (in paragraph 48) to draw a general comparison between the three Indian universities, the superficiality of his treatment of the subject is most remarkable. He appears merely to have asked the Registrar of the Calcutta University whether there was any material difference between

the standards for examination in the different institutions, and to have adopted the reply of that officer with perfect reliance. The reply was to the following effect:—

1st. That between the standards for matriculation in the three Indian universities there is no apparent difference.

2nd. That the standard for degree examinations in the Calcutta University embraces a wider range of subjects, and is more difficult than the corresponding standards in the universities of Madras and Bombay.

5. Now it is impossible not to raise the questions,—1st, Why Mr. Monteath, if he wished really to compare the universities of India, should have taken an *ex parte* opinion on the subject from a representative officer in one university, instead of applying to all three universities for information? 2nd. Why he should not have compared for himself the standards of the universities as given in their respective calendars? I will now venture to do what Mr. Monteath has omitted, and will subjoin, in parallel columns, the characteristics of the examination standards in the three universities, taken from the published calendars:—

CHARACTERISTICS OF EXAMINATION STANDARDS IN THE THREE INDIAN UNIVERSITIES.

(A.)—*Matriculation or Entrance.*

CALCUTTA.	MADRAS.	BOMBAY.
Local examinations by means of papers in 26 places besides Calcutta.	Local examinations by means of papers in 15 places besides Madras.	Examinations held in Bombay only.
No oral examination.	No oral examination.	A strict oral examination in both the languages brought up by the candidate, including English dictation.
Books, or portions of books, in English and a second language, prescribed beforehand.	Books, or portions of books, in English and a second language, prescribed beforehand.	No books prescribed; a general idiomatic knowledge of English and of a second language required.
Arithmetic, <i>minus</i> Compound Interest and some other subjects.	Arithmetic, <i>minus</i> Reduction, Practice, Simple and Compound Interest.	Arithmetic, the whole subject. The examples to be worked from first principles, and not merely by rules.
Outlines of Ancient History and of the History of India; two small Text-books prescribed.	Leading facts of the Histories of England and India. No Text-books.	Elementary History, including Greece, Rome, England, and India. No Text-books.
Outlines of General Geography.	General Geography, and Geography of India in particular.	Elementary Geography.
No Natural Philosophy.	No Natural Philosophy.	Elementary knowledge of— (a) The Mechanical Powers. (b) The laws of chemical combination, the chemistry of air and water, and the phenomena of combustion. (c) The Solar System.
Geometry—the first Four Books of Euclid, with easy deductions.	The first Three Books of Euclid.	First Four Books of Euclid, with deductions.
Algebra to Simple Equations.	Algebra to Simple Equations.	Algebra to Simple Equations.

6. From the above comparative table it will be seen that in the Calcutta and Madras Universities *books* are prescribed as subjects of examination in *languages*, whereas in the Bombay University a general idiomatic knowledge of English and of a second language is required. Any one, who is capable of judging, will see at once that this is indeed a very “material difference.” A candidate who might pass the Calcutta or Madras matriculation standard in English, would require an additional year’s preparation to pass the Bombay standard. Again, the difficulty of the Bombay matriculation test is enhanced by the addition of strict *vivâ voce* examinations, which enable the examiner to probe

probe the knowledge of the candidate, and to frustrate that pretence of knowledge which the Calcutta and Madras systems of local examination by papers only must, to some extent, tend to encourage.

7. Again, it will be observed, that, while the three universities are apparently equal in their *Geography* and *Algebra* tests for matriculation, the Bombay University requires more *Euclid* than Madras, more *Arithmetic* and more *History* than either Calcutta or Madras, and adds on one whole subject (*Elementary Natural Philosophy*), which neither of the other universities demands. On the whole, I think it may fairly be said that the matriculation standard of the Bombay University requires about one year's more preparation than would be required for a student to matriculate at Calcutta or Madras. I now proceed to compare the "First Examination in Arts" standard of the three universities.

(B.)—*First Examination in Arts.*

CALCUTTA.	MADRAS.	BOMBAY.
Local examinations by means of papers at 15 places besides Calcutta, for undergraduates of two years' standing.	Examinations held at Madras, and may be held at other places, for undergraduates of one year's standing.	Examinations at Bombay only, for undergraduates of two years' standing.
No oral examination.	No oral examination.	Oral examinations in Languages and Mathematics.
Four fixed subjects:—(1) Languages, (2) History, (3) Mathematics, pure and mixed, (4) Mental and Moral Philosophy.	Three fixed subjects:—(1) Languages, (2) History and Geography, (3) Arithmetic; <i>plus</i> one selected subject, either (a) Euclid, six books, and Algebra to Quadratic Equations, or (b) Whately's Logic.	Four fixed subjects:—Languages, History, Mathematics, Logic; <i>plus</i> one selected subject, either Butler's Sermons I., II., III., with Preface; or Analytical Geometry of the Right Line and Circle by Rectangular Co-ordinates; or Chemistry, Heat, and Electricity.
Languages must be English, and either Greek, Latin, Sanskrit, Hebrew, or Arabic. The number of books to be brought up is not definitely fixed, but the quantity appears in practice to be somewhat larger than what is prescribed in Bombay.	Languages must be English, and either Sanskrit, Greek, Latin, Hebrew, Arabic, Persian, Tamil, Telugu, Canarese, Malayalam, Singhalese, or Hindustani. Two books in each language.	Languages must be English, and either Sanskrit, Greek, Latin, Hebrew, or Arabic. Four books in each language.
History consists of History of England in a prescribed Text-book, namely, "The Student's Hume."	History of India to the Accession of Victoria. No Text-book.	Two definite periods, one in Ancient, and one in Modern History, to be notified beforehand; <i>e.g.</i> , for 1867:—(1) Grecian History to 431 B.C., (2) The Saracens from A.D. 632 to A.D. 705. No Text-books.
Mathematics, the same as the Bombay Standard, with the addition of Euclid, Book XI., Proposition 21, and Statics.	Arithmetic, the same as the Bombay Matriculation Standard. Euclid, Books I., II., III., IV., and VI.; and Algebra to Quadratic Equations; made alternative with Logic.	Mathematics—Arithmetic, with the nature and use of Logarithms; Algebra to Quadratic Equations; Euclid, Books I. to VI., with Deductions. Trigonometry—Solutions of Plane Triangles, and Expressions for the Area.
Mental and Moral Philosophy—Abercrombie on the Intellectual Powers, and on the Moral Feelings.	—	Logic (in any ordinary Compendium).

9. In surveying the above table, we see that the first examination in arts in the Madras University is for undergraduates of one year's standing. It requires no classical language, and only two books in English. It requires only

four subjects to be taken up, and gives an option between Euclid with Algebra, and Whately's Logic. It is altogether a lower kind of test than the first arts examination in the other two universities, and is scarcely, if at all, higher than the Bombay Matriculation Standard.

10. In comparing the Calcutta and Bombay standards in the above table, we find—

(a). That the Calcutta Mathematical Standard is higher by the addition of Statics, and Euclid XI., Propositions 1—21.

(b). That this addition is balanced by the addition of an extra subject at Bombay, *either* Butler's Sermons, analytical geometry, *or* chemistry, heat, and electricity.

(c). That the *History* standard at Bombay, consisting of two periods without text-books, is probably more difficult, and encourages a better form of study than the Calcutta standard, which merely prescribes "The Student's Hume."

(d). That the subject of logic in an ordinary compendium, with easy questions in logical analysis, is probably as hard, and more improving than those very *feminine* treatises on psychology and morals by Dr. Abercrombie, prescribed by the Calcutta University.

(e). That the amount of English books required at Calcutta is slightly larger* than at Bombay.

(f). But that the difference in quantity is probably balanced by the greater accuracy of knowledge which the *viva voce* examinations in the Bombay University call out.

(C.)—*Examination for B.A. Degree.*

CALCUTTA.	MADRAS.	BOMBAY.
Examinations held in Calcutta for Undergraduates of four years' standing.	Examinations held in Madras for Undergraduates of three years' standing.	Examinations held in Bombay for Undergraduates of three years' standing.
Examination by papers only, no oral examination.	Examinations by papers, with oral examination in Languages only.	Examinations by papers, with oral examinations besides in all subjects except ordinary mathematics.
Four fixed subjects:—(1) Languages, <i>i. e.</i> , English and one Classical Language, (2) History, (3) Mathematics, (4) Mental and Moral Philosophy, and the Elements of Logic.	Four fixed subjects:—(1) Languages, <i>i. e.</i> , English, one Classical or Vernacular Language, (2) History, (3) Mathematics, (4) Moral Philosophy.	Two fixed subjects:—(1) Languages, <i>i. e.</i> , English and one Classical Language, (2) Mathematics and Natural Philosophy.
One selected subject, either Mathematics, pure and mixed; or Elements of Inorganic Chemistry and of Electricity; or Geology and Physical Geography.	One selected subject, either (a) Natural Philosophy; or (b) Physical Science; or (c) Logic and Mental Philosophy.	Three subjects selected from the following: A. History. B. Logic and Moral Philosophy. C. Political Economy. D. Dynamics and Hydrostatics. E. Optics and Astronomy. F. Analytical Geometry of Two Dimensions. G. Chemistry, Heat, and Electricity. H. Physiology, Vegetable and Animal.

* The Calcutta English Books for 1868 are: Thomson, Castle of Indolence; Addison, The Campaign; Tickell, Elegy on Addison; Cowper, Table Talk; Robertson, History of America, Book I.; Paley, Reasons for Contentment; Helps, Extracts from Friends in Council. The Bombay Books are: Johnson, Lives of Swift and Pope; Sir Walter Scott's Ivanhoe; Milton's Paradise Lost, Book III; Cooper, Retirement.

CALCUTTA.	MADRAS.	BOMBAY.
In Languages the following Books are prescribed for 1868 :	Books prescribed for 1868 are—	Books prescribed for 1868 are—
<i>English.</i>	<i>English.</i>	<i>English.</i>
Shakspeare.—King Lear. Scott.—Lady of the Lake. Dryden.—Art of Poetry. Gibbon.—Life of Rienzi. Campbell.—Philosophy of Rhetoric, Book II., Chapters 5—7. Bacon.—Essays.	Shakspeare.—King Lear. Milton.—L'Allegro and Il Penseroso. Byron.—The Corsair. De Quincey, — Confessions of an English Opium Eater. Helps.—Essays written in the intervals of Business. Bacon.—Advancement of Learning, Book I.	Shakspeare.—King Lear. Wordsworth.—Prelude. Bacon.—Essays. Arnold.—Lectures on Modern History.
<i>Latin.</i>	<i>Latin.</i>	<i>Latin.</i>
Virgil.—Georgics, Book I. Juvenal.—Satires, 3, 7, 8, 10, 14. Tacitus.—Annals, Book II. Cicero.—De Naturâ Deorum.	Horace.—Epistles, and Ars Poetica. Livy.—Books XXI. and XXII. Cicero.—Pro Lege Maniliâ. Pro L. Murenâ.	Horace.—Odes, Books I. and II. Virgil.—Georgics, III. and IV. Livy.—Book III. Cicero.—De Finibus.
<i>Sanskrit.</i>	<i>Sanskrit.</i>	<i>Sanskrit.</i>
Sisupâlavadhû, First five Chapters. Bhatti Kavya, ditto - ditto. Kavya prakâsa.—10 Ullasa or Chapter.	Kirâtar juniya Virachâritra.	Harsha.—Ratnâvalî. Valmika.—Râmâyana Ayodhya Khânda. Harsha.—Naishadîya Tarkasungraha.
<i>Greek.</i>	<i>Greek.</i>	<i>Greek.</i>
Sophocles.—Ajax. Herodotus.—Book II.	Æschylus.—Prometheus. Homer.—Odyssey, Book I. Thucydides.—Book III.	Sophocles.—Œdipus Rex. Homer.—Iliad, Book I. Xenophon.—Anabasis, Book I. Herodotus.—Book II.
<i>History.</i>	<i>History.</i>	<i>History.</i>
Prescribed Text-book, namely, Elphinstone's History of India, Macfarlane's British India, or Marshman's, Vol. II. Schmitz's Histories of Greece and Rome. History of the Jews, in Taylor's Manual of Ancient History.	(1), The History of England to the Accession of Victoria. (No Text-book). (2). A selected Period, with Text-book prescribed (e. g. Guizot's Civilization of Europe).	(a). England in the 16th, 17th, and 18th Centuries. (b). Ancient History, including Greece, from Invasion of Darius to Death of Alexander, and Rome from the Gallic Invasion to Death of Augustus; and also one of the following: (c). India, Mahomedan Period; and History of the Marathas. (d). The History of the Jews from the First King to taking of Jerusalem by Titus. (No Text-books).
<i>Mathematics.</i>	<i>Mathematics.</i>	<i>Mathematics.</i>
Includes Mechanics, Hydrostatics, Hydraulics, Pneumatics, and Descriptive Astronomy.	Algebra, Geometry, and Plane Trigonometry.	The same as the Calcutta Standard for F. E. A., with the addition of Conic Sections treated Geometrically.
<i>Mental and Moral Philosophy.</i>	<i>Moral Philosophy.</i>	<i>Logic and Moral Philosophy.</i>
Payne's Elements of Mental Philosophy. Wayland's Moral Philosophy. Whately's Elements of Logic.	Whewell's Elements of Morality. <i>Logic and Mental Philosophy.</i> Thomson's Laws of Thought, Payne's Mental Philosophy.	Whately's Logic. Thomson's Outlines of the Laws of Thought. Mill's Logic, Books I. and II. Butler's Analogy, Part I., and Sermons, entire.
<i>Voluntary Mathematics.</i>	<i>Natural Philosophy.</i>	<i>D. Dynamics and Hydrostatics.</i>
Conic Sections treated Geometrically (same as included in Bombay Necessary Mathematics), and Optics, Elements of Inorganic Chemistry and of Electricity, apparently about the same as Bombay corresponding subject G.	Includes Statics and Dynamics. Hydrostatics and Pneumatics. Astronomy popularly treated. <i>Physical Science.</i> The Elements of Chemistry. Animal Physiology. Physical Geography.	Same as included in Calcutta Necessary Mathematics. E. Optics (same as in Calcutta Voluntary Mathematics), and Astronomy (same as in Calcutta Necessary Mathematics). F. Analytical Geometry of two Dimensions (reserved in Calcutta for M. A. Examination). G. Chemistry, Heat, and Electricity.

12. A comparative survey of the above table fails to show at first sight that "wider range of subjects" in which, according to Mr. Monteath's informant (paragraph 48), "the graduate at Calcutta is examined." In each university five different subjects are required to be taken up; and though at Bombay there are three subjects left to the selection of the candidate, while at Calcutta and Madras respectively only one subject is so left, yet still it will be found that whatever subjects a Bombay candidate may select, his range of study will correspond very closely with that of a Calcutta graduate. Thus, if a Bombay student selects A, B, and C (history, logic, and moral philosophy, and political economy) as his optional subjects, he will have nominally the same subjects as a Calcutta candidate, except that he will have political economy to set against *either* (a) voluntary mathematics, *or* (b) elements of inorganic chemistry, *or* (c) geology and physical geography. And political economy may safely be said to be as hard as either of the two last-named subjects.

13. The difference then, if any, between the B.A. degree standards of the two universities, must consist, not in the range of subjects viewed numerically, but in the particular standard adopted for each subject individually. Looking at this then, I should say that the Calcutta standard for necessary *mathematics* is higher than that in Bombay; that the English books prescribed at Bombay are decidedly harder, and that the *language* standard altogether (as being accompanied by an oral examination) is more strict with us; that the Bombay *history* standard implies and actually produces a knowledge of much deeper and more scientific books than Schmitz's Greece and Rome, Macfarlane's British India, and Taylor's Manual of Ancient History; and that the Bombay standard for *logic and moral philosophy* is very decidedly superior to the Calcutta standard for *mental and moral philosophy*. The Calcutta graduate then, especially if he takes up voluntary mathematics as his selected subject, will undoubtedly be a better mathematician than the Bombay graduate who has taken up history, logic, and political economy, but he will be inferior to him in historical and philosophical, and, perhaps, scholarlike, culture. If, however, the Bombay candidate takes up D, E, and F (dynamics and hydrostatics, optics and astronomy, and analytical geometry of two dimensions), he will have exceeded the whole range of mathematical study embraced in the Calcutta B.A. standard, though he will have done so by the sacrifice of *history* and *logic*.

14. It appears, then, that there is no ground for claiming a general superiority for the four years' course of Calcutta over the three years' course of Bombay, though there is for asserting the superiority of the Calcutta four years' course over the Madras three years' course. For, in fact, the Madras B.A. standard is of a lower calibre altogether, chiefly in this, that it does not require the knowledge of a classical language.

(D).—*Examination for M.A. Degree or Honours in Arts.*

CALCUTTA.	MADRAS.	BOMBAY.
There are five branches, in any one of which an examination for M.A. Degree, or Honours in Arts, may be passed:— (1) Languages. (2) History. (3) Mental and Moral Philosophy. (4) Mathematics, pure and mixed. (5) Natural and Physical Science. (Number of papers not prescribed. It seems the practice to set about six in each branch).	Four branches:— (1) Languages. (2) Mathematics. (3) Natural Sciences. (4) History and Philosophy. (Twelve papers are prescribed in each branch).	Four branches:— (1) Languages. (2) History and Philosophy. (3) Mathematics and Natural Philosophy. (4) Natural Sciences. (Six papers are prescribed in each branch).

CALCUTTA.

MADRAS.

BOMBAY.

(1) *Languages.*

One language only, either Latin, Greek, Arabic, Hebrew, or English (for those whose vernacular language is not English).

Selections are prescribed, which comprise specimens of the leading writers of the several languages above mentioned. Some knowledge of Comparative Grammar is required.

(2) *History.*

A stated period, *e.g.*, Europe during the 16th century. Books to be consulted are specified. A knowledge of the constitutional history of England and of Guizot's History of Modern Civilisation is required; also of Political Economy, and Taylor's Historical Evidence.

(3) *Mental and Moral Philosophy.*

Comprises—

Logic, Mental Philosophy, Moral Philosophy, Natural Theology; and either (a) History of Philosophy, or (b) Elements of Jurisprudence, or (c) Evidences of Revealed Religion (no text-books).

(4) *Mathematics, Pure and Mixed.*

Algebra, including the Theory of Equations.
Analytical Geometry (Plane and Solid)
Differential and Integral Calculus.
Spherical Trigonometry.
Statics.
Dynamics.
Hydrostatics, Hydraulics, and Pneumatics.
Optics.
Astronomy.

(5) *Natural and Physical Sciences.*

Chemistry (Organic and Inorganic)
Electricity.

Also one of the following:—

(a) Botany, Zoology, and Comparative Physiology.

(b) Geology, Mineralogy, and Physical Geography.

(1) *Languages.*

Two languages, namely, English, and either Sanskrit, Arabic, Greek, or Latin.

Selections prescribed, comprising less exhaustive specimens than those in the Calcutta list.

An oral examination is required.

(2) *History and Philosophy.*

The following text-books are prescribed:—

Mill's Logic.
Schmidt's Greek History.
Liddell's Roman History.
Hallam's Middle Ages, chapters II., III., IX.
Aristotle's Ethics (translation).
Mackintosh's Dissertation on Ethical Philosophy.
Mill's Political Economy.
Adam Smith's Wealth of Nations.

(3) *Mathematics.*

Algebra, with Theory of Equations.
Analytical Trigonometry.
Co-ordinate Geometry of two and three Dimensions.
Differential and Integral Calculus, with Differential Equations.
Statics, Hydrostatics, and Dynamics.
Geometrical Optics.
Spherical Trigonometry and Plane Astronomy; Newton's Principia, sections 1, 2, 3, 9 and 11.
The Lunar Theory.

(4) *Natural Sciences.*

Zoology and Animal Physiology.
Botany and Vegetable Physiology.
Geology and Mineralogy.
Chemistry.
Electricity and Magnetism.

(1) *Languages.*

Two languages, namely, English, and either Latin, Greek, Sanskrit, Arabic, or Hebrew.

Four books, two prose and two poetry, are prescribed in each language. The English books invariably include Chaucer's Canterbury Pilgrims, and three Plays of Shakespeare.

The Sanskrit books always include portions of the Rigveda. Original prose and verse composition in English is required, as well as translation from and into the classical language.

(2) *History and Philosophy.*

A selected period, *e.g.*, Europe in the 16th century, including Constitutional Law, Literature, Manners, Political Geography, and Ethnology.

Politics as a Science, including Political Economy.

Logic, including the Philosophy of the Inductive Sciences.

The History of Greek Philosophy.

The History of Modern Philosophy, from Charlemagne to the end of the 18th century.

No text-books prescribed.

In lieu of the History of Greek and of Modern Philosophy, candidates are allowed to bring up—

(a) Historical or External Evidences of Christianity.

(b) Moral or Internal Evidences of Christianity.

(3) *Mathematics and Natural Philosophy.*

Euclid and Geometrical Conic Sections.
Algebra and Trigonometry.

Newton's Principia, book I., sections 1-3, and Astronomy.

Analytical Geometry and Differential and Integral Calculus.

Statics and Dynamics.

Hydrostatics and Optics.

(4) *Natural Sciences.*

Either—

(a) Zoology, Comparative Anatomy, and Physiology.

Botany and Vegetable Physiology.

Geology.

Or,

(b) Light, Heat, and Electricity.

Chemistry, Inorganic and Organic.

Meteorology and Physical Geography.

16. In comparing the above standards for M.A. Degree, or Honours in Arts, as laid down by the three universities, it must be said, generally speaking, that the Madras standards are the highest of the three. Their *Natural Sciences* branch combines subjects which the other Universities offer as alternatives. Their *Mathematical* standard appears most highly set. Their *Languages* branch contains one language more than the Calcutta standard, and a greater quantity of books than the Bombay standard. And it must especially be observed, that the Madras University prescribes twelve papers in each branch, while the other universities require only six. This makes a material difference in the difficulty of the examination. In the *History and Philosophy* branch alone, the Madras standard descends below the other universities. The Madras rules prescribe such poor Texts as Schmidt's Greek and Liddell's Roman History, and *three Chapters* of Hallam's Middle Ages. In this there is nothing scientific or worthy of an M.A. Degree. Whether, however, the Madras standards for this Degree be high or low, it remains an unfortunate fact that, up to the present time, not a single student appears to have passed the examination or obtained the Degree.

17. Comparing now the Calcutta standards for M.A. Degree with those of Bombay, we find—(a) That the Calcutta standard for *Natural and Physical Sciences* comprises certainly more than the corresponding branch in the Bombay University. (b) That the *Mathematical* standard at Calcutta is slightly, though not much, higher than that at Bombay. (c) That the *Languages* standard at Calcutta is very greatly inferior to the Bombay standard, inasmuch as at Calcutta only one language (which may be English) is required, instead of English *plus* a classical language as with us. The list of books in English for this examination, given in the Calcutta Calendar, looks formidable, but many of the specimens which it includes are short pieces; and there can be no question, that a student who has passed ten years of his life in the study of English would find it easier to bring up this list than to prepare for the Bombay examination, *e.g.*, in Chaucer's Canterbury Pilgrims (entire), three Plays of Shakespeare, Milton's Areopagitica, and Dugald Stewart's "Lives," *plus* a knowledge of Rigveda, Mandalus III. and IV., Bhagavadgita, Vedantasutra III. and IV., and Nayakusumanjali, with a scholarlike capacity of writing both in English and Sanskrit; or else, *plus* six books of the Annals of Tacitus, three of Cicero's Epistles, a Play of Terence, and half Juvenal, with a capacity of writing fair Latin prose. The list of Sanskrit books in the Calcutta standard (as an alternative for English) appears long, but several of them are taken up at Bombay in the lower examinations; and competent authorities inform me that the Sanskrit standard for M.A. at Bombay, which has to be taken up *plus* English, is on the whole more difficult than the Sanskrit standard at Calcutta, which is taken up separately. It may be concluded, then, that the *Languages* standard at Bombay for M.A. Degree is nearly twice as hard as that at Calcutta. It is observable that in Bombay several candidates have passed in English-Latin, as well as in English-Sanskrit, whereas not a single student appears to have passed in Latin at Calcutta for this Degree. (d) We find that the branch of *History and Philosophy* in the Bombay University includes fully as much as the two alternative branches of *History* and *Mental and Moral Philosophy* in the Calcutta University would include, if taken together. The student, then, who obtains his M.A. in *History* or in *Mental and Moral Philosophy* at Calcutta, obtains it on twice as easy terms as would be allowed him at Bombay.

18. In short, it is most plain that the assertions which have led me to the above lengthy comparison, are very far from being correct: namely, that "there does not appear to be any material difference between the standards for matriculation at the three Indian universities; and that there is a difference in the standards of examination for Degrees at the three Presidencies," corresponding to the difference between a period of four years' study (at Calcutta) and a period of three years' study (at Madras or Bombay). I have shown clearly, in the first place, that the Bombay standard for Matriculation is "materially" high and stricter than the Matriculation standards of either of the two other universities; and, in the second place, that there is no general superiority (corresponding to a year's extra study) in the Calcutta Degree standards over those prescribed at Bombay.

19. The leading fact which, I think, discloses itself in comparing the Universities of Calcutta and Bombay, and which is very interesting, is that there is a difference of kind between these two universities, corresponding to the difference between Cambridge and Oxford. The Calcutta University has been, I believe, chiefly moulded by Cambridge men, and the Bombay University has certainly taken its direction from a preponderance of Oxford men among its founders. The result of this difference of direction has been (amongst other things) to give a preponderance to mathematical and physical studies in Calcutta, and to historical and philosophical studies in Bombay. The effect of the different spirit of the two universities upon the mind of Eastern and Western India will remain to be seen in the future; but, as yet, I am humbly of opinion that neither university has any very great cause for self-gratulation. We are both, it seems to me, in complete infancy, and have much in our development that requires careful attention.

20. Before leaving this subject, there are only one or two characteristics in the practical working of the Bombay University, which I would wish to call attention to:—1st. I think our system of oral examinations in all subjects, from Matriculation to B.A. Degree, very valuable and important. Our comparatively small area of extent enables us to require all candidates (even for matriculation) to come to Bombay for examination, and this gives us a great advantage. 2nd. Our strictness in refusing to recognise (or affiliate) institutions not teaching up to the highest university standard (which contrasts widely with the practice of the other universities), is based on the feeling that a candidate for our degrees would not receive the full benefits of university training, unless the full period of his university course were spent under the influences of some institution which was, as far as possible, collegiate and academical in character. We wish our graduates not only to pass our examinations, but also to bear a certain stamp derived from their place of study. 3rd. In connection with the above, and as part of academical discipline, we have instituted "University Terms," to keep which the student must, after matriculation, attend an exact number of days, and not a nominal period (such as "a year" or "two years") at a recognised college. This rule has been found to work well. Of neither of the above-mentioned features of our system has mention been made in Mr. Monteath's "Note."

21. Turning now from Mr. Monteath's remarks on the Indian Universities, I will beg to call attention to the general *résumé*, in which he aims at giving "a brief outline of the main features of educational operations in the different Provinces of India." Nothing, I submit, could be more meagre, superficial, or misrepresentative, than the "brief outline" of educational operations in the Bombay Presidency given in paragraphs 16-19 of the "Note," which are quoted below for reference.* Mr. Monteath, throughout these paragraphs, mixes

* 16. In Bombay, education of the higher classes was, until recently, in a very unsatisfactory state. The Elphinstone and Poona Colleges had been publicly condemned by the Government Examiners of 1855-56, and though they were shortly after subjected to a thorough reform, the work of renovation was slow; and it is only within the last few years these institutions have really deserved the name of college. The Government higher class schools, now nine in number, may be said to have had an equally recent origin.

17. But perhaps the greatest difficulty hitherto experienced in the Bombay educational operations has been the provision of the elementary education for the agricultural and labouring classes. The steps taken prior to 1854 consisted in the establishment of a limited number of vernacular schools, maintained and managed solely by Government, in the most promising localities. This was supplemented after 1854 by the introduction of what was called, the "partially self-supporting system." The establishment of schools, entirely at the cost of Government, was too expensive to admit of much extension, and the condition of partial self-support opened the way for a time to an enlargement of the field of operations at a comparatively small increase of cost. Under this system more than 200 schools were opened in two years; but its effects soon began to appear. It was easy for a zealous educational officer to induce village communities to consent to contribute towards the establishment and maintenance of such schools, but it was difficult to keep up an interest in them, and impossible to enforce payment of contributions when the interest had vanished.

18. The partially self-supporting system was therefore gradually dropped; enhanced fee rates being made, wherever possible, to take the place of the reluctantly paid popular subscription. By a redistribution of education expenditure, provision was made in 1859 for a considerable extension of operations, and the Bombay authorities began about the same time to look about for fresh sources of local income. In 1862 an enactment was passed, one object of which was to legalise the appropriation of municipal funds to the support of schools; and in 1864 the Bombay Government took the very important step of levying an extra land assessment or education cess. The number of vernacular schools of the lower class maintained by Government now amounts to 1,108, of which nearly 200 were established during the last year (1865-66) from the proceeds of the education cess.

19. Although, therefore, elementary education in Bombay may not as yet have attained any very marked development, there is every prospect of progress in future years.

mixes up the present and past state of things in such a way as to suggest an unduly disparaging notion of the education in this Presidency. Of our colleges he merely records the historical fact, that twelve years ago they were thought to require reform, and were reformed accordingly, and of our high schools he only says that they are of recent origin. Of middle class education he says nothing, and of elementary education he says that it "may not as yet have attained any very marked development," coupling this supposition with an incorrect statement about the "Education Cess," to the effect that out of the proceeds of this cess, *Government maintains* nearly 200 vernacular schools.

22. All this, I submit, looks like the writing of a person who is unacquainted with his subject, and therefore unable to give definite information. Had Mr. Monteath, before publishing what he has done, referred to me for confirmation or correction, I should probably have suggested to him the following points as constituting the salient characteristics of educational operations in Bombay:—

(a.) Bombay is the Presidency in which more, proportionately, has been done for education by direct Government agency, and less by private exertion and liberality, than in the other Presidencies and Provinces. This is owing chiefly to the numerical weakness of missionary bodies in the west of India. The large amount of private money which, during the last half century, has been expended on education in Bengal, is out of all comparison to the analogous private expenditure in Bombay.

(b.) Bombay is the Presidency in which organisation of the Educational Department, though begun late, has been most carried out. This is shown in the introduction of regular standards of examination, under which all pupils, both in Governmental and aided institutions, are tested and returned; also, by the application of the same scale of standards to the classification of schools, no boy being allowed to enter a high school till he has passed a certain examination in English and vernacular, and no boy being allowed to enter an Anglo-vernacular school till he has passed under a certain vernacular standard.

(c.) Bombay is distinguished for its vernacular schools. I believe that our "superior vernacular schools" excel those of the same class elsewhere in India. This statement might, however, be tested by a comparison of our vernacular standards with the kind of teaching elsewhere practised. The Government vernacular schools are more numerous in this Presidency, and a larger proportion of the Imperial grant has been expended on them, than elsewhere.

(d.) The introduction of the local cess in Bombay appears to have solved the question, how to get at the "masses," *i.e.*, the agricultural population of India. On this point, I beg to refer to paragraphs 40 and 41 of my annual report for 1865-66, and to paragraph 26 of my report for 1866-67 (which has appeared since the publication of the "Note"). It would have been an interesting question, and well worthy of discussion, had Mr. Monteath, after obtaining sufficient information about the Bombay local cess, set himself to compare it with the "Hulkabundee system." I believe that the Bombay system is the more popular and efficient, though its character appears always to have been misapprehended by the Government of India.

(e.) Bombay is the Presidency in which the bold experiment has been introduced of assigning grants to private institutions on the system of payment for results. Our rules differ from the English "Revised Code," in that we undertake to deal with higher, as well as primary instruction. The attempt is, I submit, of such an interesting and important character, that greater attention should have been paid to it in a "Note on the State of Education."

(f.) The Book Department in Bombay stands distinguished from that in all other Presidencies by the greater amount of its sales. As shown (though not remarked on) by Mr. Monteath in paragraphs 341-358, the Bombay Book Department in 1865-66 sold books to the value of 1,15,714 rupees, being more than double the sale effected by the same Department in any other Presidency.

(g.) The operation of the "Fund for the Encouragement of Literature" in this Presidency might have been, but was not, noticed by Mr. Monteath.

23. When I read what Mr. Monteath had written of education in this Presidency, I could not help being reminded of a remark submitted by me in forwarding

forwarding my special Report of Education for the year 1863-64, which was as follows:—

“I am humbly of opinion that no verdict of comparison should be passed on this and the other similar reports, without further reference to the several Directors of Public Instruction. They should in the first place be applied to for additional information where wanted; and secondly, I submit that they should have an opportunity of seeing and remarking upon the ‘General Report,’ to be transmitted to England, while it is yet in draft.”

The present “Note” having been drawn up, apparently hastily, without any such reference to local sources of information, has been sent to England, and is liable to create to some extent a false impression of the subject of which it treats; and, still more, it is liable to create a flat impression, no central point of view having been taken, facts not having been scrutinised with penetration, and *quality* of education being apparently disregarded. I have been myself unable to gather from it real information about the state of education in Bengal and other Provinces, and any inquirer about the progress made in this Presidency would, I think, be either misled or disappointed.

24. I do not wish to deny the great difficulty of drawing up such a “Note” as that undertaken by Mr. Monteath, where many different systems have to be compared by a writer who knows only one. But what I would wish humbly to suggest to Government is, that in order to make such “Notes” more valuable in future, and to prevent them doing positive injustice and harm, they should be drawn up in a more thorough and less superficial way. The only method of attaining a trustworthy “General Report” of the kind, which occurs to me, would be to commission some officer to travel through India during the course of the year before writing, and by conference with local education authorities to obtain such an insight into the real state of things as might enable him to read with understanding the various reports and other documents which he would have afterwards to compare. I venture on this suggestion, because the Government of India has announced its intention of ordering a “Note on the State of Education” to be annually prepared. And *that* Government evidently already regards Mr. Monteath’s “Note” as a standard of reference in considering educational questions.

25. In the above remarks, I have endeavoured not merely to complain of Mr. Monteath, but at the same time to furnish some useful information as to the real character of the three Indian universities and of the Bombay educational system. It would be an endless task to go into all the questions which might be raised on Mr. Monteath’s statements and remarks. I will conclude by offering some brief “Notes on the Note,” which may possibly serve as suggestions to the writer of the next similar compilation:—

(a.) The terms used in paragraph 7, “great masses of the people,” “labouring and agricultural classes,” “lower strata of the people,” &c.—are, as regards India, somewhat indefinite. The question should be looked at more in reference to *caste*. In almost all villages there are poor Brahmins, whose children attend the schools. In one sense these belong, in another they do not belong, to the “lower strata of the people.” A discriminating return of the various castes under instruction in India would be most interesting.

(b.) In paragraph 10-12, the reader much feels the want of a definition of terms. What is meant exactly by “Zillah Schools,” “Tehsilee Schools,” and “Hulkabundee Schools?” Nothing but a statement of the standards of teaching in these schools will make their names intelligible, or render comparison between them and “High Schools,” first, a second grade Anglo-vernacular school, and superior and inferior vernacular schools, possible.

(c.) Paragraph 15 suggests a comparison between the Godavery District rate system, where it is found “impossible” to get “qualified men to act as Commissioners for the assessment of the rate and the management of the schools,” with the Bombay local cess system, which works with ease and efficiency.

(d.) Under paragraph 27, it would be interesting and most useful if the relation were pointed out of the Imperial assignment in each Province—1st, to local funds; 2nd, to Presidential revenues; 3rd, to population; 4th, to pupils under instruction.

(e.) The remarks in paragraph 28, on “Private Expenditure,” are open to question. It is always the interest and tendency of private school managers to

state "private expenditure" at its highest, and probably a portion of it may not have been incurred for *secular* education. It is difficult to see why in India, any more than in England, private expenditure should form part of the State's returns.

(f.) In paragraph 64, "boarding houses," in connection with the colleges and schools of the North West Provinces are spoken of as "rather a novel feature in Indian educational institutions." They have, however, been introduced for many years in the Bombay Presidency, and work with great and increasing success.

(g.) In paragraph 82, the terms "lower class" and "middle class" are indefinite for want of a specification of standards. Even the terms "reading, writing, and simple arithmetic" are not precise enough. "Reading" may range from the "Primer" up to the "Sixth Reading Book," which contains lessons on science; "writing," from easy words up to good current writing; "arithmetic," from numeration upwards.

(h.) In paragraph 96, there appears to be some mistake, for schools are set down as higher class schools, in which the average fee per annum is stated as Rs. 1. 11.

(i.) In paragraph 137, I find mention of my proposal for the re-organisation of 19 middle class schools as adequate feeders to the high schools. I beg to refer the future compiler to paragraph 39 and 60 of my Annual Report for 1866-67, from which he will learn that the much required sanction of the Government of India for this measure had not, at the time of writing the Report, and, I may add, has not to this day, been received.

(j.) Paragraph 141 contains apparently a misapprehension of some sort, as the receipts of middle class schools over expenditure are given in my Report as 12,167 rupees for the entire Presidency, and not as 48,864 rupees. Mr. Monteath should, I submit, have referred to me for explanation of the "fact" which he supposed himself to have discovered, instead of publishing a paragraph implying blame on the subject.

(k.) Paragraph 139, speaks of the average cost of education in Bombay middle class schools as "high," on account of relatively high rates of pay prevailing, &c. It might also have been added that the cost *seemed* high for want of a proper standard of comparison. Bombay middle class *English* schools are evidently compared with middle class *vernacular* schools in Bengal.

(l.) The statements contained in paragraph 158 give no information, for want of the standard of "final examination" for gurus.

(m.) In paragraph 167 there are some remarks which are difficult to understand. What is meant by the "middle classes" in a native village?

(n.) In paragraph 180, the information given about indigenous schools in the North West Provinces is most loose. One only wonders how the Director of Public Instruction in those Provinces can descend to enter such schools in his Returns, merely because they are "visited from time to time by the Deputy Inspectors." If Government wished me to follow this example, I could swell my Returns to an almost indefinite extent.

(o.) Under paragraph 189, my remarks on local cess, showing its admirable working, would have been more appropriately quoted than in paragraph 140, where they were quoted by Mr. Monteath. Had I been referred to for information, I should have been able to inform Mr. Monteath that the difference between the receipts of local cess and the expenditure on lower class schools was to be accounted for by the large outlay made on village school buildings.

(p.) In paragraph 336, the reader is informed that "in the more recent operations of the Bombay Education Department, higher class Anglo-vernacular and English education has received its full share of attention."

To this remark, however, I would beg the future compiler to add, that the attention bestowed on higher class education has only as yet resulted in proposals which, unfortunately, have not met with the approval and sanction of the Government of India.

I have, &c.

(signed) A. Grant,
Director of Public Instruction.

NOTE ON THE STATE OF EDUCATION IN INDIA, 1865-66.

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NOTE ON THE STATE OF EDUCATION IN INDIA, 1865-66.

1. THE object of this note is to collect, in a convenient form, information and statistics respecting the educational measures now in operation in India, both by the direct instrumentality of Government officers, and by private agency. The chief sources of information are the yearly education reports prepared in the several Presidencies and Provinces. The last reports relate to the year 1865-66, and hence the information and statistics given in this note relate also to that year. The fact that the statistical tables of the Bombay Education Report were not received till March 1867, will show how difficult it is to prepare a note of this kind, till after the lapse of a considerable time from the date to which the information refers. I have, of course, availed myself of more recent information in respect of important points where a reference to subsequent proceedings seemed desirable; but, speaking generally, the review of educational measures and institutions relates to the year 1865-66. The table of contents prefixed to this note gives a sufficient idea of the general scope of the review, and of the arrangement of subjects.

SECTION I.

GENERAL RESUMÉ OF EDUCATIONAL OPERATIONS IN THE SEVERAL PRESIDENCIES AND PROVINCES OF INDIA.

Bengal.
North-Western
Provinces.
Punjab.
Madras.
Bombay.
Oude.
Central Provinces.
Mysore.

2. There were in 1865-66 altogether eight Presidencies and Provinces, as given on the margin, having organised Departments of Education, each superintended, in the manner contemplated by the Education Despatch of 1854, by a Director of Public Instruction and staff of inspectors. Steps have since been taken for organising similar Departments of Education in the Hyderabad Assigned Territories and in British Burmah.

3. Fuller information and statistics in respect of universities, colleges, and the several classes of schools in each Province will be given in the following sections of this note. My present object is to give in this section a brief outline of the main features of educational operations in the different Provinces of India.

4. Universities have been established in the three Presidency towns of Calcutta, Madras, and Bombay, respecting each of which separate particulars will be given hereafter. It is sufficient here to remark that the effect of these institutions on the more advanced grades of educational operations appears to have been beneficial in a very marked degree. Not very long ago the Director of Public Instruction in Bengal, writing of the Calcutta University, remarked that it had proved "a powerful and valuable stimulus to every college and school in the country." Similar testimony was borne to the Madras Institution by the head of the Education Department in that Presidency, who stated that "of all the measures which have been adopted of late for the spread, and especially for the elevation of education, it may be doubted if there be any that has proved more efficacious than its establishment;" and the general effect of the operation of the Bombay University was stated to have been "very marked indeed," both as supplying a "test which can be relied on," and as affording a "great stimulus to both schools and colleges;" and these opinions, expressed about two years ago, have been amply borne out by the continued and yearly increasing influence of the universities in the three Presidencies.

5. An examination of the figures given in the following sections respecting colleges and schools will show a great diversity in the channels in which education operations have been made to flow in the several Presidencies and

and Provinces, and a few general remarks on this subject will not be out of place.

6. The Province of Bengal stands clearly foremost in respect of the higher classes of education. The main endeavours of the Education Department have been directed to this end. In Bengal are to be found the largest number and the best specimens of colleges and schools of the higher and middle classes, filled by pupils whose appreciation of the education received is attested by the comparatively large amount of the fees paid. In no other Province of India has education of a higher kind so great a money value as in Bengal. So far the Bengal system has prospered. The main channel chosen for directing its efforts has been education of the higher and middle classes, and in this respect it has unquestionably succeeded in a degree unequalled in any other part of India.

7. But at this point, *i. e.*, at the development of a good higher and middle class education, the Bengal operations might, until quite recently, have been said practically to terminate. The great masses of the people of Bengal, including the labouring and agricultural classes, were reported in 1863-64 to be "in reality scarcely touched as yet by our educational operations." "Various plans," as the Director of Public Instruction wrote in that year, "have been devised and tried for bringing school instruction to bear upon them (the lower orders of the people above referred to), but the result has almost uniformly been that the schools which have been organised or improved for their benefit have been at once taken possession of and monopolised by classes who stand higher in the social scale." The fact was, that up to that time no good plan for diffusing elementary instruction among the masses of the people had been devised. The efforts to improve the indigenous village schools of the country had failed; and the few schools established by Government as models, though affording a good vernacular education to a limited number of pupils of a higher social grade, seemed to have no effect whatever in raising the level of the indigenous schools below them. Even the establishment by Government of cheap elementary village schools, designed to supersede the indigenous schools, though succeeding in the North-Western Provinces, seemed to fail in Bengal in that part of the country (Behar) where it was tried. It was, perhaps, the apparent hopelessness of the attempt at popular education that gave such prominence, in the minds of the Bengal Educational authorities, to the theory that education must filter downwards, and that it was impossible to reach the lower strata of the people till after the upper strata had been operated on. This theory was frequently and very broadly stated, as will be seen from the following extract from a letter written by the Director in January 1865:—

"I have only to reiterate here what I have had occasion to insist upon in several recent communications, that the liberal education of those classes of the community who, from their station in society, have the control of the education of the poorer classes, is still the most important object which can engage the attention of Government. The education of the lower orders of society should assuredly not be neglected, but it is a primary condition of the spread of education among all classes that full provision should *first* be made for the education of that class on which depends the education of all the rest."

8. But it may, I think, be reasonably doubted whether the theory of the downward filtration of education, however true as a general principle, will not be found wanting when applied to the lowest strata of the population; and it is certain at all events that by far the most successful results which have as yet appeared in any part of India in the education of those classes have been the fruits of efforts applied directly to the agricultural and labouring population independently of all other measures for promoting education of a higher order. It is satisfactory, therefore, to be able to state in respect of Bengal, that, within the last few years, a scheme has been set on foot which seems to give good promise of really influencing the education of the lower orders of the people: I refer to what is called the normal school system for training Gurus. Full information respecting this system will be given under the head of lower class schools in Section V.; and meantime I will only remark that the Guru students of the normal institutions are the nominees of the villagers, who bind themselves to receive them back as their Patshala teachers when qualified; the

Government, on the other hand, giving to every qualified teacher so employed a grant of five rupees per mensem towards his salary.

9. In the *North-Western Provinces* we find, so far as the direction of the main channel of educational operations is concerned, a marked contrast to Bengal.

10. Perhaps there is no one of the older Provinces in which the means of education of the higher and middle classes is more meagre than in the North-Western Provinces; and it is only quite recently that a proposal has been made by the Government of the North-Western Provinces, and sanctioned by the Government of India, which contemplates the establishment of 21 Zillah schools in the North-Western Provinces, in lieu of the two middle class institutions now on the list. Some of them will probably at once take rank as higher class institutions, educating up to the university entrance standard; and all of them will doubtless eventually come up to this standard. This is unquestionably a move in the right direction towards the supply of a very obvious want in the North-Western Provinces.

11. In those Provinces, however, we find that measures have for many years been in operation for the elementary education of the great masses of the people on a more extended scale, and with, perhaps, more successful results than in any other part of India. The education of the lower classes of the people is in fact the main channel in which educational operations in the North-Western Provinces have been made to flow.

12. It was about the year 1850 that Mr. Thomason set on foot organised efforts for improving the education of the lower classes of the people. These efforts were directed to the establishment, at the several Tehsil stations, of vernacular schools intended to serve as models for the improvement of the indigenous village schools, the inspection and encouragement of which by rewards, &c., were also provided for. A very considerable amount of success attended these efforts; and Mr. Thomason's Tehsilee schools still form an important feature of the school system in the North-Western Provinces. The improvement of the indigenous schools has, however, proved to be a matter of great difficulty, and more or less unsatisfactory in its results. The system is consequently being gradually superseded by the establishment of what are called Circuit or Hulkabundee schools, supported by the proceeds of an educational cess. This cess is a most important help to the Education Department. It forms a component part of all new settlements of the land revenue, so that ere long the Hulkabundee school system is expected to "cover the land." Even now, in districts where the cess does not form part of the existing settlement, arrangements are very generally made with the consent of the people for its payment.

13. In the *Punjab*, educational measures of an organised character were not set on foot till within a comparatively recent period; and the numerous educational institutions and operations, which now bear favourable comparison with those of some older Provinces, may be almost said to have sprung into existence within the last few years. Profiting by the experience of other Provinces, the Punjab authorities have authorised a system of education which avoids the defects observable in Bengal and the North-Western Provinces. The Punjab system aims at providing simultaneously for the higher class of education and for the elementary instruction of the mass of the people,—copying for the former object the admirable system and organisation of the Bengal Zillah schools, and for the latter object the system of Hulkabundee schools so successfully elaborated in the North-Western Provinces. A glance at the figures given in the following sections of this note (Sections IV. and V.) will show the creditable development which educational operations in the Punjab have already attained, not only by the direct instrumentality of Government, but also by private efforts.

14. In the *Madras Presidency*, we find a relatively fair number of higher and middle class schools.

15. But in respect of lower class schools, the Madras Presidency certainly appears to be behind hand. Nothing, or next to nothing, has ever been done in this direction by the direct instrumentality of Government; and hence, of the

the total number of 842 schools of this class shown in the Madras returns, the great bulk (825) come under the head of private institutions. The Government has endeavoured, in various ways, to encourage this class of schools. Grants-in-aid have been given chiefly in the Tinnevely district to missionary societies undertaking to supervise and maintain elementary schools; and this system, so far as it has extended, is stated to have worked satisfactorily. In a portion of the Godavery district a system of village schools, supported by an educational rate, founded on the supposed consent of the ratepayers, was commenced about 12 years ago, but the scheme wanted stability, and it was to provide for this that the Madras Education Act of 1863 was passed; the object of the law being "to provide for the maintenance of certain schools in the Delta Talooks of the Godavery district under the Presidency of Fort St. George, and to enable the inhabitants of any other town, village, or place in any district under the said Presidency to assess themselves for the establishment and maintenance of schools." The Act was not brought into operation in the Godavery district till July 1865; and the first reports of its working were not very favourable, the principal difficulty being the impossibility of getting qualified men to act as commissioners for the assessment of the rate and the management of the schools. The "rate schools," as they are called, are 79 in number; of which 72 are in the Godavery district, and seven in other districts. In 1864-65 there were 75, so that the extension of the system during 1865-66 consisted in an addition of only four schools. Hopes, however, appear to be entertained that this system of voluntary assessment for educational purposes will in the end work well. A third system has also recently been set on foot, chiefly in the Coimbatore and Nellore districts, the main object of which is the inspection, encouragement, and improvement of indigenous schools. Although this system has not worked satisfactorily in other Provinces, favourable mention of it is made in the Madras reports; and it may, perhaps, become an important means of showing the people the necessity and advantage of improving their schools, and thus paving the way for the introduction of a better class of institutions under the educational rate system.

16. In *Bombay*, education of the higher class was, until recently, in a very unsatisfactory state. The Elphinstone and Poona Colleges had been publicly condemned by the Government Examiners of 1855-56; and, though they were shortly after subjected to a thorough reform, the work of renovation was slow; and it is only within the last few years that these institutions have really deserved the name of college. The Government higher class schools, now nine in number, may be said to have had an equally recent origin.

17. But, perhaps, the greatest difficulty hitherto experienced in the *Bombay* educational operations has been the provision of elementary education for the agricultural and labouring classes. The steps taken prior to 1854 consisted in the establishment of a limited number of vernacular schools, maintained and managed solely by Government, in the most promising localities. This was supplemented after 1854 by the introduction of what was called, the "partially self-supporting system." The establishment of schools entirely at the cost of Government was too expensive to admit of much extension, and the condition of partial self-support opened the way for a time to an enlargement of the field of operations at a comparatively small increase of cost. Under this system more than 200 schools were opened in two years; but its defects soon began to appear. It was easy for a zealous educational officer to induce village communities to consent to contribute towards the establishment and maintenance of such schools; but it was difficult to keep up an interest in them, and impossible to enforce payment of contributions when the interest had vanished.

18. The partially self-supporting system was, therefore, gradually dropped; enhanced fee rates being made, wherever possible, to take the place of the reluctantly paid popular subscription. By a re-distribution of education expenditure, provision was made in 1859 for a considerable extension of operations, and the *Bombay* authorities began about the same time to look about for fresh sources of local income. In 1862 an enactment was passed, one object of which was to legalise the appropriation of municipal funds to the support of schools; and in 1864 the *Bombay* Government took the very important step of levying an extra land assessment or education cess. The number of vernacular schools of the lower class maintained by Government now amounts to

1,108, of which nearly 200 were established during the last year (1865-66) from the proceeds of the education cess.

19. Although, therefore, elementary education in Bombay may not as yet have attained any very marked development, there is every prospect of progress in future years.

20. Turning now to the smaller administrations, it may be remarked, as regards the Province of *Oude*, that, until within the last three years or so, there was no educational system at all. Grants-in-aid were given to some eight private schools, of which five were called Talookdaree schools owing to the partial support given to them by the Talookdars, and there were about 20 Tehsilee schools maintained by fees, contributions, and other local funds. The whole Government expenditure on education did not then exceed 12,000 rupees per annum.

21. In 1863-64 the sanction of Government was given to an organised system of educational operations in Oude, providing, besides direction and inspection, for the establishment of 10 Zillah schools and 34 Tehsil schools; with a liberal allowance for grants-in-aid, including one large grant of 25,000 rupees per annum for the Canning College,—an institution founded primarily on the support of the Oude Talookdars. The gradual re-settlement of the Oude districts, with provision for an educational cess, is also preparing the way for the establishment of village schools on the Hulkabundee system of the North-Western Provinces. The cess had, in 1865-66, been introduced fully only in one district (Oonao), and partially in seven other districts. In July 1865 the first set of village schools, 60 in number, were established in the Oonao district, and provided with teachers trained in a normal school established at Lucknow for the purpose. This work of training teachers for village schools is being pushed on vigorously, so as to have trained teachers ready for the village schools, which will, in due course, be opened in other districts.

22. Not long before the period of the educational movement in respect of Oude, above described, a systematic plan of operations had been set on foot, in the *Central Provinces*. Besides a controlling and inspecting staff of officers, provision was made for the maintenance of 10 Anglo-vernacular or Zillah schools, which will all be eventually assimilated, in respect of equipments and status, to the higher class Zillah schools of Bengal. Meantime only one of them is able to claim that rank. Vernacular education has received corresponding attention, 96 town schools and 646 village schools (on the Hulkabundee system) having already been established, and provision made by the establishment of six normal schools for the training of village school masters. An attempt has also been made in the Central Provinces to encourage indigenous village schools on the plan of payment by results under the grant-in-aid rules; but as yet only 25 schools have presented pupils for examination. A large number (656) of indigenous village schools, chiefly in the Sumbulpore district, have, however, been encouraged and improved by the interest taken in them by district officers, as well as by casual gifts in money or books for the masters or pupils.

23. The Education Department of *Mysore* was organised in 1857. There are now in the Province 10 higher class institutions (six Government and four private), 16 middle class schools (nine Government and seven private, and (what is a very small proportion) only 47 lower class schools (32 Government and 15 private). The progress made in the means of elementary education is certainly small for a Province which has had an organised Education Department for the last 10 years.

24. In *British Burmah*, although no organised Education Department had been established till towards the close of 1866, a not inconsiderable advance has been made in educational operations. There are three Government District Schools of the middle class, supplemented by a very satisfactory proportion of private institutions, numbering 28, under the grant-in-aid rules. These private institutions are chiefly supported by missionary bodies, to whose efforts the cause of education in British Burmah is much indebted. There are also 259 village schools supported by the same agency, to some of which Government grants-in-aid are given.

25. The Chief Commissioner of British Burmah regards the Buddhist monasteries, which are in fact the indigenous schools of the country, as a good groundwork for a future extension or improvement of the means of elementary vernacular education. The system of indigenous education in British Burmah, as carried on in these monasteries, will, the Chief Commissioner says, "bear comparison with any educational system existing in any other province under British rule." It is already widely diffused, giving, as stated by the Chief Commissioner, "a knowledge of reading and writing to three-fourths of the juvenile male population"; and the Chief Commissioner looks forward to the improvement of these schools mainly by inducing the monks to accept approved school books for the instruction of their pupils.

26. In the *Hyderabad Assigned Districts*, as already stated, steps have been taken for the organisation of a separate Education Department under a Director of Public Instruction; and the scheme in view contemplates the establishment of two high schools (one in each district), together with tehsil schools and village schools.

SECTION II.

GENERAL FINANCIAL STATISTICS.

27. THE cost for 1865-66 of the establishments employed in the several Presidencies and Provinces for directing and superintending educational operations may be shown as follows, side by side with the cost for the same year of the instruction controlled by them:—

		Direction and Inspection.	Instruction, including all Educational Charges not coming under the Preceding Head.	TOTAL.
		Rs.	Rs.	Rs.
Bengal - - - -	From Imperial Funds -	2,32,131	11,48,345	13,80,476
	From Local Funds -	- -	3,40,308	3,40,308
	Private Expenditure -	- -	5,66,015	5,66,015
	TOTAL - - -	2,32,131	20,54,668	22,86,799
North Western Provinces -	From Imperial Funds -	1,81,460	6,03,228	7,84,688
	From Local Funds -	- -	4,07,612	4,07,612
	Private Expenditure -	- -	4,07,850	4,07,850
	TOTAL - - -	1,81,460	14,18,690	16,00,150
Punjab - - - -	From Imperial Funds -	1,66,358	3,17,713	4,84,071
	From Local Funds -	11,515	2,52,394	2,63,909
	Private Expenditure -	- -	1,51,204	1,51,204
	TOTAL - - -	1,77,873	7,21,311	8,99,184
Madras - - - -	From Imperial Funds -	1,23,952	4,96,717	6,20,669
	From Local Funds -	- -	95,714	95,714
	Private Expenditure -	- -	3,06,433	3,06,433
	TOTAL - - -	1,23,952	8,98,864	10,22,816

		Direction and Inspection.	Instruction, including all Educational Charges not coming under the Preceding Head.	TOTAL.
		<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
Bombay - - -	From Imperial Funds -	1,64,965	7,05,102	8,70,067
	From Local Funds -	5,938	8,38,294	8,44,232
	Private Expenditure -			
	TOTAL - - -	1,70,903	15,43,396	17,14,299
Oude - - -	From Imperial Funds -	22,981	1,19,464	1,42,445
	From Local Funds -	-	35,667	35,667
	Private Expenditure -	-	36,130	36,130
	TOTAL - - -	22,981	1,91,261	2,14,242
Central Provinces -	From Imperial Funds -	58,884	76,579	1,35,463
	From Local Funds -	300	1,69,447	1,69,747
	Private Expenditure -	-	32,856	32,856
	TOTAL - - -	59,184	2,78,882	3,38,066
Mysore - - -	From Imperial Funds -	26,582	85,439	1,12,021
	From Local Funds -	-	-	-
	Private Expenditure -	-	29,492	29,492
	TOTAL - - -	26,582	1,14,931	1,41,513

I have not included in the above statement the province of British Burmah, or the Hyderabad Assigned Districts (Berars), because the Education Reports received from them do not give the required information. The Directors of Public Instruction recently appointed in those provinces will probably supply this deficiency in future.

28. It may be explained generally that the figures given under the head "Local Funds" represent money received and administered by Government officers or educational committees, but derived from local sources, such as education cesses, school fees, private endowments, subscriptions, &c. The figures given under the head of "Private Expenditure" may be said generally to represent the expenditure from private sources on private schools which are under the inspection of Government officers. The amount shown under this head must be more or less approximate, and probably considerably below the real amount; and there is, of course, a considerable amount of private expenditure on education which never comes under the cognisance of Government, as, for instance, expenditure on schools which are neither aided nor inspected by Government, and with the accounts of which the Government has nothing to do.

SECTION III.

UNIVERSITIES.

Universities.

29. THE Despatch of 1854 conveyed the orders of the late Court of Directors in regard to the establishment of universities in India. An opinion was expressed that "the form of government and functions" of the London University might be advantageously followed in their general features. It was stated that the examinations for degrees should not include any subjects connected with religious belief, and that in regard to affiliation the same neutrality should be observed.

30. The

30. The standards for common degrees were to be fixed so as "to command respect without discouraging the efforts of deserving students," while in the competition for honours care was to be taken to "maintain such a standard as would afford a guarantee for high ability and valuable attainments." Under these instructions, universities have been established at Calcutta, Madras, and Bombay, incorporated by the Acts marginally indicated. Further powers for the appointment of new degrees by bye-laws, subject to the confirmation of the Governor General in Council in regard to Calcutta, and by the local Governments in regard to Bombay and Madras, were given to the senates by a subsequent Act XLVII. of 1860.

Act II. of 1857.—Calcutta.
Act XXII. of 1857.—Bombay.
Act XXVII. of 1857.—Madras.

31. While it has been a declared object to preserve a general harmony of constitution in these institutions, it has not been attempted to enforce a rigorous uniformity in matters in which local considerations, and the judgment of the local Governments, might beneficially have free scope. In the three universities, consequently, we find a general similarity of constitution, and a considerable diversity in minor details, and in a few not unimportant points. And although the form of government and regulations of the London University were, in the first instance, more or less exactly adopted, various modifications have from time to time been made to adapt them to the requirements of this country.

Calcutta University.

32. The Calcutta University provides for the grant of the following degrees and licenses :—

Arts	-	-	-	{ Bachelor of Arts (B. A.) Master of Arts (M. A.)
Law	-	-	-	{ Licentiate in Law (L. L.) Bachelor in Law (B. L.) Doctor in Law (D. L.)
Medicine	-	-	-	{ Licentiate in Medicine and Surgery (L. M. S.) Bachelor in Medicine (M. B.) Doctor in Medicine (M. D.)
Civil Engineering				{ Licentiate in Civil Engineering (L. C. E.) Bachelor in Civil Engineering (B. C. E.) Master in Civil Engineering (M. C. E.)

Besides the examinations for the above degrees, there are the "Entrance Examination" and the "First Examination in Arts" of a somewhat lower standard than the B. A. degree examination. There are also two examinations for the license in medicine and two for the degree of Bachelor in Medicine, the first being an intermediate, and the second a final examination. The "First Examination in Arts" was introduced in 1861, and holds an intermediate place between the entrance and B. A. examinations. The object was to encourage undergraduates to continue their studies beyond the entrance, and in this it has fully answered the expectations formed of its probable effect. In each of the professional faculties there are, as will be observed, two degrees and a license. This arrangement was introduced about three years ago. There had from the first been a licentiate degree in the faculty of medicine, and similar degrees were introduced in 1861 in the faculties of law and engineering; the intention being to enable undergraduates to obtain a professional qualification without graduating in arts. But these licentiate degrees were not popular either with the senate or the students, and hence it was that the present arrangement of two degrees and a license was introduced in each of the professional faculties.

33. Two important changes in the regulations as to arts were made in the year 1863-64. The first was the removal of the vernacular languages of India from the subjects of examination for the first examination in arts and the B. A. examination; the effect of this measure being to compel all candidates in arts to take up one of the following classical languages, viz., Latin, Greek, Sanscrit, Hebrew, or Arabic. The second was the re-distribution of the subjects of examination for the B. A. degree, by which "Physical Science" was removed from the list of necessary* subjects of examination, and in its place candidates were allowed to select one of the four following subjects :—(a) geometry and optics; (b) elements of inorganic chemistry and electricity; (c) elements

* (1) Languages.
(2) History.
(3) Mathematics.
(4) Mental and Moral Science.

of zoology and comparative physiology; and (d) geology and physical geography.

34. The Registrar of the Calcutta University has kindly furnished me with the following memorandum on points connected with the more recent history of the university :—

Since 1864 no changes have been made in the standards of examination. In the regulations the form of certificate, which candidates for matriculation are required to produce, has been altered in such a manner as to require from head masters of schools an expression of opinion as to the fitness of a candidate to go up to the examination. This change was made for the purpose of imposing a check on the admission of candidates to the entrance examination who were not likely to pass. The new form of certificate was adopted for the first time at the last examination in 1866, and evidently operated to check the admission of ill-qualified candidates. A proposal will be submitted to the senate at the next annual meeting to introduce a similar change in the certificate of candidates coming up to the First Examination in Arts and the B. A. Examination. Besides checking the admission of candidates to the University Examinations, who are not, in the opinion of their tutors, likely to pass the restriction, it is thought, will act beneficially in preserving better discipline in affiliated colleges.

The university building is now in course of construction, and will be completed early in 1868.

No reply has been received from the Government of India to the letter from the University of 25th June 1862, regarding the establishment of scholarships and of a professorship of natural and experimental philosophy, nor have these questions again been discussed in the senate with a view to a further application to Government. The senate met in July 1866 to consider the best mode of appropriating Mr. Premchund Roychund's donation of two lakhs of rupees; and amongst other plans then considered, was one for applying the proceeds of this donation in founding University Scholarships of a similar nature to those the senate recommended the Government to establish in 1862. A proposal to devote the proceeds of the donation to the endowment of a Professorship of Mathematical and Physical Science was also considered at the same time. Both proposals were however rejected, and the following plan was adopted :—

1. Five studentships, to be named after the donor, of 2,000 rupees a year each, to be founded and maintained by the interest of the two lakhs of rupees and its accumulations during the next five years.

2. Any M. A. of this university to be eligible for one of these studentships during eight years from the time that he passed the entrance examination.

3. Such studentship to be tenable for five years, and one election to be made annually after examination.

4. Candidates to give notice of intention to appear six months before the examination, and to select not more than five of the following subjects, each to receive a maximum of 1,000 marks :—

1. English.
2. Latin.
3. Greek.
4. Sanscrit.
5. Arabic.
6. History of Greece, Rome, England, and India; and a general view of the History of Modern Europe from Guizot, Hallam, &c., to include Political Economy.
7. Moral Sciences, viz., Ethics, Mental Philosophy, and Logic.
8. Pure Mathematics.
9. Mixed Mathematics.
10. Physical Science.

- 5.—The names of the students to be printed in the Calendar after the fellows, and after them the names of ex-students.

The first examination for the award of a Premchund Roychund studentship will be held in the spring of 1868.

The Maharajah of Vizianagram, in a letter to the Government of Bengal, dated 31st March 1865, expressed a desire to found a university scholarship of 50 rupees a month, for the purpose of encouraging a liberal education in literature and science; and his Highness requested that the scholarship might be designated the "Maharajah of Vizianagram Scholarship," and awarded to the first graduate in the B. A. list of the year (being a native of India), on condition of his prosecuting a further course of study in an affiliated college for the attainment of the degree of M. A. His Highness further directed that application should be made to Rajah Sutt Churn Ghosal, of Bhookeylas, for the annual payment on account of this scholarship, until such time as it might be convenient for his Highness to invest an amount in Government securities which would produce an annual income of 600 rupees. This scholarship has been awarded in accordance with the wishes of the founder during the last two

two years; but, pending the receipt of the Government securities, the endowment has not been recorded in the University Calendar.

The committee of the Duff Memorial Fund, at a meeting on the 22nd February 1866, recommended to the subscribers, that the funds at their disposal (about 20,000 rupees) should be invested in Government securities, and transferred to the University, for the purpose of founding four scholarships, each of 15 rupees a month, tenable for one year, to be awarded upon certain conditions, to students after passing the first examination in arts. The subscribers, at a meeting on 6th April 1866, approved of the committee's proposal; and the Senate, at a meeting on 21st July following, accepted this benefaction from the subscribers to the fund. The four scholarships have been awarded upon the result of the last examination in December.

35. Within the last year an important alteration was made in the rules for affiliation; formerly, institutions could be affiliated in arts only "for the B. A. degree," *i. e.* only if they provided the means of education up to the standard of that degree. Institutions can now be affiliated in arts without the above-mentioned limitation; and under this alteration of the rule, the Anglo-Persian Department of the Calcutta Madrissa has quite recently been affiliated in arts, as educating up to the standard of the "First Examination in Arts."

The following list of institutions affiliated to the Calcutta University is taken from the Calendar for 1866-67:—

Government Institutions.				Private Institutions.			
1. Presidency College, Calcutta	-			15. Bishop's College, Calcutta	-		
2. Medical " "	-			16. Doveton " "	-		
3. Sanscrit " "	-			17. St. Paul's School, " "	-		
4. Hooghly " Hooghly	-			18. Free Church Institution, Calcutta	-		
5. Dacca " Dacca	-			19. La Martiniere College, " "	-		
6. Kishnaghur " Kishnaghur	-			20. London Missionary Society's Institution, Bhowanipore, Calcutta	-		
7. Berhampore " Berhampore	-			21. St. Xavier's College, " "	-		
8. Patna " Patna	-			22. General Assembly's Institution, Calcutta	-		
				23. Cathedral Mission College, Calcutta	-		
9. Agra College, Agra	-			24. Serampore College, Calcutta	-		
10. Benares " Benares	-			25. St. John's College, Agra	-		
11. Bareilly " Bareilly	-			26. Joynarain's " Benares	-		
12. Ajmere School, Ajmere	-			27. Thomason Civil Engineering College, Roorkee	-		
				28. Lahore Mission School, Lahore	-		
13. Saugor School, Saugor	-			29. St. Thomas's College, Colombo	-		
14. Queen's College, Colombo	-						

36. The statistical results of the Calcutta University examinations are interesting, as showing the rapid development of the influence of the University on educational progress. The following figures represent these results in a brief form:—

NUMBER of CANDIDATES at Calcutta University Examinations, and the Number Passed in each Year since 1857.

YEARS.	Entrance.		First Examination in Arts.		Bachelor of Arts.		Master of Arts.		License in Law.		Bachelor in Law.		License in Medicine and Surgery.		Bachelor in Medicine.		Doctor of Medicine.		License in Civil Engineering.	
	Number of Candidates.	Number Passed.	Number of Candidates.	Number passed.	Number of Candidates.	Number Passed.	Number of Candidates.	Number Passed.	Number of Candidates.	Number Passed.	Number of Candidates.	Number Passed.	First Examination.	Second Examination.	First Examination.	Second Examination.	Number of Candidates.	Number Passed.	Number of Candidates.	Number Passed.
7 -	244	162	-	-	-	-	-	-	-	-	-	-	12	12	-	-	-	-	-	-
8 -	464	111	-	-	13	2	-	-	-	-	19	11	40	24	-	-	-	-	-	-
9 -	1,411	583	-	-	20	10	-	-	-	-	20	3	31	12	-	-	-	-	-	-
0 -	808	415	-	-	65	13	-	-	-	-	22	10	31	13	-	-	-	-	-	-
1 -	1,058	477	163	97	39	15	1	-	7	2	17	14	16	7	20	14	-	-	10	6
2 -	1,114	417	220	99	34	24	3	-	16	8	13	13	33	18	17	7	-	-	18	14
3 -	1,307	690	272	149	35	25	7	6	19	9	15	9	35	16	19	14	-	-	-	-
4 -	1,396	702	321	151	66	30	8	3	1	1	22	19	42	22	25	11	-	-	10	5
5 -	1,500	510	446	202	82	45	15	11	7	5	17	17	34	14	20	18	2	2	5	2
6 -	1,350	638	426	131	122	79	18	15	17	13	22	11	35	10	26	20	5	5	9	-
TOTAL -	10,652	4,705	1,845	829	476	243	52	35	67	38	167	107	309	148	127	84	7	7	52	27

37. The Madras University provides for the grant of the following degrees, viz :—

Arts	-	-	-	{ Bachelor of Arts, (B. A.) Master of Arts, (M. A.)
Law	-	-	-	{ Bachelor of Laws, (B. L.) Master of Laws, (M. L.)
Medicine	-	-	-	{ Bachelor of Medicine and Master in Surgery, (B. M. and C. M.) Doctor of Medicine, (M. D.)
Civil Engineering	-			Bachelor of Civil Engineering, (B. C. E.)

Besides the examinations for the above degrees, there are the "Matriculation Examination" and the "First Examination in Arts;" the latter being, as in the Calcutta University, intermediate between the matriculation and B. A. examinations. For the degree of "B. M. and C. M." there is a "Preliminary Scientific Examination" and a "First Examination," both of which must be passed before the final or "Second Examination." For the degree of M. D. there is no examination in respect of candidates producing a certificate of having been engaged two years in the practice of their profession subsequent to having taken the degree of "B. M. and C. M.;" other candidates on producing diplomas of the Madras Medical College, and certificates of having been engaged for five years in the practice of their profession, are allowed to present themselves for examination.

38. The Madras University regulations in respect of examinations have, like those of the Calcutta University, undergone considerable modification since the establishment of the university. It would be tedious and out of place in a note of this kind to attempt to enumerate the various alterations made. The principal changes up to 1863-64 were briefly indicated by the Director of Public Instruction in his report for that year in the following terms, viz. :—

(1).—The range of history, in the matriculation and Bachelor of Arts examinations, has been considerably reduced.

(2).—An examination called the first in arts has been interposed between the matriculation and the Bachelor of Arts examinations; and in this test, arithmetic and Indian history are finally disposed of, so as to allow of the examination in the higher subjects for the Bachelor of Arts degree being made of a more searching character.

(3).—For the M. A. degree in languages it is now prescribed that English shall be brought up by every candidate, whereas originally a student was permitted to offer himself for examination in Latin and Greek to the exclusion of English. According to the plan first laid down, history, with scarcely anything beside a certain amount of political economy, formed a distinct branch in which the degree of M. A. could be obtained. The revised regulations have thrown out the historical branch *per se*, and associate history with the subjects in another branch.

(4).—The distinction originally drawn, in some cases, between ordinary and honour degrees of the same name has been done away with, and a higher degree has been made to correspond with a more extensive range of attainments. Also, instead of placing passed candidates in any class in alphabetical order, as was done at first, they are now ranked in order of merit, as determined by the aggregate marks obtained in the examination.

(5).—The standard of the examinations in law has been raised; and the subjects of examination, which were originally laid down in a vague and unsatisfactory manner, have been distinctly specified. In the room, too, of the degree of Bachelor of Law with honours, a new degree of Master of Law has been instituted, upon the principle mentioned just above.

(6).—At the establishment of the university, two degrees were provided in civil engineering, viz., those of graduate and master. The designation of the lower has been changed from graduate to bachelor; and the higher degree has been placed in abeyance for a time. Also the range of subjects for the lower test has been reduced, language and history no longer entering the examination, which is confined to branches of knowledge immediately connected with the profession of a civil engineer.

The alterations since that time have had for their object—

(7).—Raising the number of marks assigned to English in the first arts examination and in the B. A. examination.

(8).—Raising

(8).—Raising the number of marks assigned to hydraulics in the examination for the degree of B. C. E.,—the object being to give greater prominence to this important branch in the studies of those qualifying themselves as engineers.

(9).—The institution of three examinations instead of two for the degree of “B. M. and C. M.”

39. The Madras University calendar for 1865-66 contains the following list of affiliated institutions, viz. :—

“Institutions Affiliated to the University of Madras.”

- “Church Mission Society’s Native English School, Palamcottah.
- “Church Mission Society’s College, Cottayam.
- “Church Mission Society’s Institution, Cotta, near Colombo.
- “Church Mission Society’s High School, Jaffna.
- “Free Church Mission Institution, Madras.
- “Government Normal School, Madras.
- “Grammar School, Ootacamund.
- “High School, Bangalore.
- “London Mission Institution, Madras.
- “London Mission Institution, Bangalore.
- “London Mission Theological Seminary, Bangalore.
- “Medical College, } Madras.
- “Presidency College, }
- “Provincial School, Kumbhakónam.
- “Provincial School, Bellary.
- “Provincial School, Calicut.
- “Wesleyan Anglo-Vernacular Institution, Madras.
- “Wesleyan Native Educational Institution, Bangalore.
- “Wesleyan Central School, Jaffna.”

40. The following remarks made by the Director of Public Instruction, Madras, in his annual report of 1863-64, may be quoted in connection with the above list :—

“It is necessary here to observe that whether a school is, or is not, affiliated is a matter of little importance in the Madras Presidency, as students are now admitted to a university examination without being compelled to produce certificates from affiliated institutions. Many schools which send up candidates to the university examinations are not affiliated, while some of those which are affiliated have sent up few or no candidates. Moreover, the privilege of affiliation has been given to schools on their affording evidence, not of possessing means of educating up to the B. A. standard, but of being capable of sending up qualified candidates to the matriculation examination.”

Affiliation of little consequence as regards the University of Madras.

41. The following statement contains statistics of the Madras University examinations, prepared in a form similar to that already given for the Calcutta University :—

STATEMENT of Results of Madras University Examinations from 1857 to 1866.

YEARS.	Number of Candidates Examined.	Matriculation Examination.	Number of Candidates Examined.	First Arts Examination.	Number of Candidates Examined.	Bachelor of Arts Examination.	Number of Candidates Examined.	Bachelor of Civil Engineering Examination.	Number of Candidates Examined.	Bachelor of Laws Examination.	REMARKS.
		Passed.		Passed.		Passed.		Passed.		Passed.	
1857-58 {	Sept, 1857	41	36	-	No Examination.	-	No Examination.	-	No Examination.	-	Beside the results tabulated in the statement, a candidate obtained the degree of M. D. in 1858-59, being the only one who has as yet taken a degree in medicine. Two other candidates have passed preliminary examinations in medicine.
	Feb, 1858	79	18	-	"	2	"	-	"	"	
1858-59	-	57	30	-	"	9	8	-	"	"	
1859-60	-	52	23	-	"	10	5	-	"	4	
1860-61	-	80	48	-	"	10	6	-	"	5	
1861-62	-	195	82	-	"	6	5	-	"	5	
1862-63	-	252	105	-	"	12	8	-	"	4	
1863-64	-	390	143	8	23	21	11	6	1	10	
1864-65	-	565	223	167	50	29	11	5	4	3	
1865-66	-	555	229	214	76	8	6	-	-	2	
TOTAL	-	2,266	937	463	149	107	60	11	5	33	16

42. So far as the professional faculties are concerned, these statistics do not show any marked development of the university operations; but, as regards the Faculty of Arts, there is very decided evidence of the growing influence of the Institution. It is true that the statistics of the B. A. examination for the last year 1865-66 show a great falling off as compared with the preceding years; but this is accounted for by the circumstance that the year 1865-66 was the first in which a rule requiring candidates for that degree to have passed the first Arts Examination came into operation. The results of the Matriculation Examination deserve especial attention. This examination, although the lowest in the scale of university examinations, is by no means the least important. It may almost be said to be the most important, for, as remarked by the Director of Public Instruction in his Report of 1863-64, it affords "leverage immediately operative in raising the whole of what may be termed middle class education."

Bombay University.

43. The Bombay University provides for the grant of the following degrees and license :—

Arts	-	-	-	{ Bachelor of Arts, (B. A.) Master of Arts, (M. A.)
Law	-	-	-	- Bachelor of Laws, (B. L.)
Medicine	-	-	-	{ Licentiate of Medicine, (L. M.) Doctor of Medicine, (M. D.)
Civil Engineering	-	-	-	- Master of Civil Engineering, (M. C. E.)

Besides the examinations for the above mentioned degrees, there is the "Matriculation Examination," and also, as in the Calcutta and Madras Universities, a "First Examination in Arts" holding an intermediate place between the Matriculation and B. A. degrees. There are two examinations for the degree of L. M., no candidate being eligible for the second or final examination until two years after he has passed the first.

44. The following Statement gives for the Bombay University statistics of a kind similar to those already given for the Calcutta and Madras Universities :—

Entrance Examination.		First Arts Examination.		B. A. Examination.		M. A. Examination.		L. M. (final) Examination.	
Number of Candidates.	Passed.	Number of Candidates.	Passed.	Number of Candidates.	Passed.	Number of Candidates.	Passed.	Number of Candidates.	Passed.
1859 - - - 126	22								
1860 - - - 42	14								
1861 - - - 86	39								
1862 - - - 134	30	- - -	-	6	4	- - -	-	7	4
1862-63 - - - 143	56	(Not given)	15	6	3	- - -	-	3	3
1863-64 - - - 143	56	(Not given)	16	15	8	(Not given)	2	3	3
1864-65 - (not given)	109	(Not given)	15	(Not given)	12	(Not given)	2	(Not given)	5

45. It will be observed, that the only examinations held for professional degrees have been in the faculty of medicine for the degree of L. M. And even in the faculty of arts the results exhibited are but small when compared with those of the Madras and Calcutta Universities. But, nevertheless, there is a decided tendency to improvement; and it may be expected that the great attention recently given in Bombay to the development of high school and college education will have a marked effect on the university statistics.

46. The

46. The following institutions are shown in the Bombay Calendar of 1865-66 as affiliated to the university, viz. :—

Elphinstone College	-	-	-	-	-	Bombay.
Poona College	-	-	-	-	-	Poona.
Free General Assembly's Institution	.	-	-	-	-	Bombay.
Government Law School	-	-	-	-	-	Bombay.
Grant Medical College	-	-	-	-	-	Bombay.

It is a small list, and all of the institutions but one are in Bombay itself.

47. An encouraging feature in the history of the Bombay University is the magnificence of the contributions which private liberality has placed at its disposal.

In the year 1862-63 the sum of 20,000 rupees was presented by Munguldass Nathoobhoy, Esquire, for the foundation of a travelling fellowship.

In 1863-64 the donations received and offered amounted to no less than 4,71,200 rupees; the principal items in the long list being—(1) a donation of 1,75,000 rupees from 18 gentlemen towards founding a fellowship in memory of the late Earl Canning; (2) a donation of 1,00,000 rupees from Cowasjee Jehangeer Ready Money, Esquire, for the erection of university buildings; (3) a like donation of 1,00,000 rupees from Sorabjee Pestonjee Framjee, Esquire, towards founding a fellowship; (4) a donation of 75,000 rupees towards the establishment of a professorship of Economic Science.

In 1864-65, besides a donation of 1,200 rupees for providing university mace, there were two munificent donations from Premchund Roychund; the *first*, 2,00,000 rupees, towards the erection of a university library; and the *second*, 2,00,000 rupees, for the erection of a tower to contain a large clock and a set of joy-bells.

Concluding Remarks respecting the three Universities.

48. Having given above detailed information and statistics respecting each of the three Indian universities, I may here introduce the following remarks, furnished to me by the Registrar of the Calcutta University, in reply to a question of mine as to whether there was any material difference in the standards for examination in the different institutions :—

“There does not appear to be any material difference in the standards for *Matriculation* at the three Indian universities.

“At the Universities of Bombay and Madras, however, a candidate may appear at the B. A. examination after a period of *three* years' study at an affiliated college, whilst in the University of Calcutta a period of *four* years' study is required. It might be expected that there would be a corresponding difference in the standards of examination for degrees at the three Presidencies, and such in fact there appears to be. Both at Bombay and Madras the practice of allowing an undergraduate to exercise an option in the subjects he will take up is permitted to a greater extent than at Calcutta; and, whilst the graduate is examined in a wider range of subjects, it does not seem, from a comparison of the examination papers of the three universities, that the knowledge of individual subjects exacted from a graduate of this university is more superficial than at the sister universities of Bombay and Madras.”

SECTION IV.

COLLEGES FOR GENERAL EDUCATION.

49. As will be gathered from the heading of this section, it is proposed to deal only with colleges for general education, leaving professional colleges, as well as professional departments of colleges, to be treated of under the subsequent head of “Institutions for Special Education.”

50. It may be well also to note that the remarks and statistics here submitted relate only to institutions which are either under Government management, or subject to the inspection of Government officers. There are some affiliated institutions (principally in Bengal and Madras) which are neither aided by Government, nor subject to the inspection of Government officers; but the local education reports contain no information respecting them, and it would obviously be impossible at present to get from the managers of such

institutions the statistics necessary for incorporation in the statements now given.

51. The following statement gives a comparative view of the statistics of college education in the several Presidencies and Provinces :—

STATEMENT containing Statistics regarding Colleges for General Education for the year 1865-66.

		Bengal.		North Western Provinces.		Punjab.		Madras.		Bombay.	
		Government Institutions.	Private Institutions.	Government Institutions.	Private Institutions.	Government Institutions.	Private Institutions.	Government Institutions.	Private Institutions.	Government Institutions.	Private Institutions.
Number of Colleges	- -	7	5	3	4	2	1	1	1	2	none.
Number of pupils attending them	Number on rolls	753	339	190	*	36	15	82	*	167	
	Average attendance -	723	315	159	*	29	12	62	*	143	
Expenditure	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
	From Government (Imperial Funds)	1,27,673	19,374	64,579	*	33,824	447	36,888	*	74,945	
	From private or local sources	76,417	57,855	9,101	*	1,420	3,753	3,118	*	33,201	
TOTAL - - -		2,04,090	77,229	73,680	*	35,244	4,200	40,006	*	1,08,146	
Annual cost of educating each pupil -	Cost to Government -	176	61	406	*	1,166	37	558	*	524	
	Total cost -	282	245	485	*	1,215	350	607	*	756	

* Note.—The four private colleges in the North Western Provinces and the one institution of this class in Madras are also collegiate schools, and the statistics given in the local education reports do not distinguish between the college and school branches. It would serve no good purpose to enter in this statement the combined statistics, and the columns have, therefore, been left blank.

52. The following statement contains a classification of the pupils attending the colleges :—

CLASSIFIED STATEMENT of Pupils attending the Colleges for General Education in 1865-66.

				Hindoos.	Mahomedans.	Others.	Total.
Bengal	Government Institutions	-	-	727	14	8	*749
	Private - „	-	-	294	13	32	339
North Western Provinces.	Government Institutions	-	-	†169	†19	†2	190
	Private - „	-	-	†	†	†	†
Punjab	Government Institutions	-	-	29	4	3	36
	Private - „	-	-	10	3	2	15
Madras	Government Institutions	-	-	73	-	9	82
	Private - „	-	-	†	†	†	†
Bombay	Government Institutions	-	-	124	4	39	167
	Private - „	-	-	-	-	-	-
Total	Government Institutions	-	-	1,122	41	61	1,224
	Private - „	-	-	304	16	34	354
GRAND TOTAL - - -				1,426	57	95	1,578

* Exclusive of four out students in Patna College.

† Given approximately in the same proportion as for the college and school departments combined.

‡ Separate statistics for the college department not available.

53. In the Government institutions the annual cost of educating each pupil is, as will be observed, by far the greatest in the Punjab, where it amounts to no less than 1,215 rupees. The Punjab colleges were only recently formed, and the small number of pupils as yet attending them gives rise to this result.

It

It may be that the establishment of two expensively equipped colleges in the Punjab (at Lahore and Delhi) was a little in advance of the actual and immediate requirements of that province in respect of college education; but the various zillah schools of the Punjab, which are yearly improving in status, will doubtless ere long provide a supply of students more commensurate with the cost of the college establishments maintained for their education, and thus bring the present excessive expense of educating college pupils in the Punjab nearer to the level of other provinces.

54. The division of pupils into "Hindoos," "Mahomedans" and "Others" shows, as might be expected, the very large predominance of the Hindoo element among the students. Apart altogether from the relative proportion of Hindoos among the upper and middle classes of the population of the country, it is unquestionable that the Hindoos, as a race, take more readily to our system of education. Of the whole number of Hindoos and Mahomedans attending colleges, only $3\frac{1}{2}$ per cent. are Mahomedans.

55. I now proceed to offer a few remarks respecting the colleges of each Presidency and Province.

Bengal.

56. The institutions of this class in Bengal are given in detail on the margin.

The Presidency College was established in 1855 on the basis of the old Hindoo College. A full account of the history of the Hindoo College, the destruction of its exclusive character, and its incorporation in the plan for the foundation of the Presidency College, as well as a sketch of the scheme on which the latter was founded, will be found in No. XIV. of the Selections from the Records of the Bengal Government. The main features of the re-organisation consisted in the establishment of chairs for moral and mental philosophy and logic, for natural philosophy and astronomy, for natural history and geology, which did not exist in the old Hindoo College; and also in the establishment on a defined footing of a separate department for the study of law. In 1864-65 a third department of civil engineering was added to the college, consequent upon the abolition of the separate Civil Engineering College. The professional departments will, however, be separately treated of under the head of "Institutions for Special Education."

57. The Presidency College (general department) is conducted by a principal and six professors, aided by five assistant professors. The following brief account of the institution is taken from the Bengal Education Report of 1863-64:—

"The course of study for under-graduate students extends over four years, and a fifth-year class is also maintained, consisting of graduates who are preparing to present themselves at the examination for university honours, or for the M.A. degree. The college possesses an endowment fund, partly derived from subscriptions raised to commemorate the services rendered to education by Baboo Dwarkanath Tagore, Sir Edward Ryan, and Mr. Bird, and partly from sums contributed by the native community for the maintenance of the old Hindoo College. These funds yield a yearly income of 4,132 rupees, which is devoted to the establishment of 10 graduate scholarships, tenable for one year. The holders, who must be Bachelors of Arts, are required to attend the college regularly, and to prepare themselves for the examination for university honours in any branch they may select."

The large attendance (monthly average 301) at this college, the high fee rate (10 rupees per mensem, about to be increased to 12 rupees), yielding an income of 32,000 rupees per annum, and the great prominence which the institution has in all the university lists, indicate the position which it has attained, and mark it out as a most encouraging proof of the stimulus which of late years has been given to education in the metropolis. It is true that since 1864, the number of pupils has decreased from 367 to 310, but this is due to

<i>Government Institutions.</i>		<i>Date of Foundation.</i>
1. Presidency College, Calcutta	-	1855
2. Dacca College, Dacca	-	1841
3. Berhampore College, Berhampore	-	1853
4. Kishnaghur College, Kishnaghur	-	1846
5. Patna College, Patna	-	1862
6. Sanscrit College, Calcutta	-	1836
7. Hooghly College, Hooghly	-	1824
<i>Private Institutions.</i>		
1. Cathedral Mission College, Calcutta	-	1865
2. Doveton College, Calcutta	-	1855
3. Free Church Institution, Calcutta	-	1830
4. General Assembly's Institution, Calcutta	-	1830
5. St. Xavier's College, Calcutta	-	1860

the large extension of the means of college education which has recently taken place in various other colleges both in Calcutta and in the Mofussil; and it is no subject, therefore, for regret. The classes are now stated to be as full as is consistent with a proper attention on the part of the professors to the studies of their pupils.

Dacca College.

58. The next college on the Bengal list is the Dacca Institution. The Dacca College has long held the position of the best Mofussil College in Bengal, but until within the last few years the upper classes existed in little more than the name; the few students in them being almost without exception scholarship-holders. But of late the Dacca College has improved in this respect. In 1865-66 this college furnished two successful candidates for the degree of M.A., four for the degree of B.A., and 22 for the First Arts Examination.

Berhampore and
Kishnaghur Col-
leges.

59. The next two colleges on the list are those at Berhampore and Kishnaghur. It was only recently that the staff of these colleges was raised so as to enable them to educate up to the B.A. degree; 3rd and 4th year classes being opened for this purpose in 1865-66. Both of these colleges have greatly extended their usefulness within the last few years, the aggregate number of pupils having risen from 64 in 1862 to 148 in 1866.

Patna College.

60. The next college (Patna) was opened in 1862 for the purpose chiefly of affording the means of a good education to the Mahomedan population of Patna and its neighbourhood. There are only as yet 20 students in the college (distributed among three classes), and most of them are scholarship-holders. The Patna College is, of course, chiefly dependent for its students on the pupils of the surrounding zillah schools who pass the entrance examination; and it will, perhaps, take some time before the advantages of a college education come to be appreciated in that part of the country in the same degree as in some other parts of Bengal.

Oriental Colleges.

61. The next two colleges are those called the Sanscrit and Hooghly Colleges; they are the remains of what were once purely Oriental seminaries, and I have thought it best to reserve an account of them for a separate section (VII.) of this note.

Private Colleges.

62. The next five institutions on the Bengal list are private colleges aided by Government. The Cathedral Mission College was established in 1865 in connection with the Church Missionary Society, and is supported mainly by the Cathedral Church Mission Fund made over to the Church Missionary Society in 1857 by the late Bishop Wilson, by whom the fund was originated. The institution educates up to the B.A. standard. The Doveton College was established in 1855, when a legacy of 2,30,000 rupees was left by Captain Doveton to the parental academy, with which the college in question is connected. This college, and the Free Church of Scotland Institution, founded in 1830 by Dr. Duff, rank clearly first in the list of private aided colleges in Bengal, as is evidenced by their success in the university examinations. The two remaining institutions (General Assembly's Institution and St. Xavier's College) make but little figure in the university returns.

63. The following returns of the university examinations in the faculty of arts, in respect of Bengal students, may appropriately be introduced here as affording some means of judging the relative position of Government and private colleges:—

	First Arts Examination 1865-66.	Passed B.A. Examination 1865-66.	M.A. Exa- mination 1865-66.
From Government Colleges - -	130	56	13
From Private Colleges (aided) -	32	15	1
Ditto - ditto (unaided) -	3	—	—
Schoolmasters - - - -	13	4	1

North-Western Provinces.

64. The colleges in the North-Western Provinces are given on the margin. There is another Government institution in the North-Western Provinces, viz., the Ajmere Collegiate School, which has been affiliated to the Calcutta University, but which is not shown by the director of public instruction in the list of colleges. Probably the institution does not practically train undergraduate students to the extent that would warrant its being placed in the list. The main point of interest in connection with the three Government colleges is the establishment within the last few years of boarding-houses, in connection with them and the attached schools. These boarding-houses constitute rather a novel feature in Indian Educational Institutions, and they are stated to have worked extremely well. The primary object in view was to encourage the attendance at these central institutions of youths from other parts of the country, and the object has been fully attained. The boarding-houses have, for the most part, as many inmates as they can contain; and the teachers have found that the boarders are their best pupils. The pupils have been encouraged, with success, to take an interest in gardening and other useful employments out of school hours, as well as in athletic sports and English games. Full accounts of these boarding-houses will be found in the education reports of the North-Western Provinces for the last three years.

65. Of the private colleges in the North-Western Provinces, St. John's College, Agra, was established in 1850 in connection with the Church Missionary Society at Agra; the large and handsome Gothic building in which the classes are now held being completed in 1850. Joy Narain's College at Benares was founded as a School in 1818 by Rajah Joy Narain Ghosal Bahadoor, in gratitude for his recovery from a protracted illness. It was raised to the status of a college in 1853.

66. The colleges of the North-Western Provinces do not as yet make much show in the University returns, but considerable improvement is observable, as will be seen from the following figures:—

	1863.	1864.	1865.
First Arts Examination - - -	4	5	9
B. L. Examination - . -	1.	2	3

Punjab.

67. In the Punjab there are three colleges, as noted in the margin, all of which were established in 1864. The short experience of the two Government colleges has not been of the most encouraging kind. It has been found difficult to get students, and still more difficult to keep them, so much so that the necessity of paying all, or nearly all, of them for their attendance, under the name of scholarships, was seriously pressed upon the consideration of Government. As already pointed out, the calculated cost of educating pupils in the Government colleges of the Punjab (viz., 1,215 rupees for each pupil per annum) is enormously high; but, as the pupils increase in numbers, the average cost of each will, of course, be less. And there seems to be ground for expecting that the numbers will increase,* for not only are the Punjab zillah schools (the natural feeders of the colleges) improving, but in the new rules for the examination of candidates, for tehsildarships and other appointments due weight has been accorded to success in the University Examinations. For the present, however, it is difficult to deny that the expense of the two Government colleges in the Punjab is disproportionate to the results obtained.

	Government.	Date of Foundation.
Lahore College - - -	-	- 1864
Delhi College - - -	-	- 1864
	Private.	
Lahore Mission College -	-	1864

68. The

* There was in 1865-66 an average attendance of only eight Students in the Lahore College, and 21 in the Delhi College.

68. The single private college in the Punjab was engrafted, in 1864, on the Lahore Mission School,—an institution founded in 1849, soon after the annexation of the Punjab, by the American presbyterian mission. The college department, although yet in its infancy, appears to give good promise of success. The students are not very numerous; only 15, with an average attendance of 12; but this is considerably more than are to be found in the Government college at the same place (Lahore), which has only 12 students, with an average attendance of eight. It is to be noted also that in 1865-66, the first year in which any Punjab candidates presented themselves for the First Arts Examination, half (five) of the successful students, including the only one classed in the 1st division, belonged to this private college, the other half coming from the two Government colleges at Lahore and Delhi.

Madras.

69. The two colleges in Madras are the Presidency College (Government), and the Doveton Protestant College (Private). The Madras Presidency College assumed that name in 1855, having been previously known as the Madras University. It is only within the last few years that it has really deserved the name of college, but the results of each year have testified to its improving condition. The number of students, which for 1862-63 was only 47, has steadily increased to 81 for 1865-66; and more than half of the last-mentioned number came from other districts of the Presidency, which shows that the growing appreciation of college education is not confined to the Presidency town. The following statistics of the University show the position held by the Madras Presidency College relatively to other Institutions:—

	Presidency College.	Other Government Institutions.	Private Institutions.
Passed in First Arts Examination in 1865-66 - - - - -	29	24	23
Passed in B. A. - - - - -	6	None.	None.

70. And here it is necessary to explain that, although there is in the Madras Presidency only one Government college for general education, there are several other institutions (provincial schools, &c.,) which educate, as the above statistics show, beyond the matriculation standard, and which, whether affiliated or not, are allowed by the Madras University to send up candidates.

71. The Doveton Protestant College, which is the only private institution shown in the Madras Statistical Returns under the head of Colleges, seems hardly to deserve that distinction. During the last three years, 1863-64, 1864-65, and 1865-66, the Doveton College has not passed a single B. A. student, and has passed only four students in the First Arts Examination. There are other private institutions which have done more; and it is difficult, therefore, to understand on what principle a classification has been made in the Education Report, which singles out the Doveton Protestant College as the only private institution entitled to the rank of a college for general education.

Bombay.

72. The two Colleges in Bombay are both Government institutions, viz., the Elphinstone College, Bombay; and the Poona College, Poona. There are no private colleges open to Government inspection; but there is one private college, the "Free General Assembly's Institution," which has been affiliated to the University, and is excluded from present notice simply because, not being open to Government inspection, no statistics respecting it are embodied in the Education Reports. This Institution, however, has had but very limited success in the University

University Examination, having passed altogether only two B. A. students. The University Examination Returns in the Faculty of Arts are composed almost exclusively of pupils from the Elphinstone and Poona Colleges. These two Government colleges underwent a thorough reform in 1857-58, an account of which will be found in the Report of that year. They were both recognized by the University in 1860.

73. The following account of the Elphinstone College is taken from the Bombay University Calendar of 1865-66 :—

“ Elphinstone College arose by separation in the year 1856 of the Professorial element from the ‘ Elphinstone Institution,’ which henceforth became a High School.

“ The Elphinstone Institution had its origin in a meeting of the Bombay Native Education Society, on the 22nd August 1827, to consider the most appropriate method of testifying the affectionate and respectful sentiments of the inhabitants of Bombay to the Honourable Mountstuart Elphinstone, on his resignation of the Government of Bombay. The result of this meeting was, that a sum of money, amounting to 2,29,656 rupees, was collected by public subscription towards the endowment of professorships for teaching the English language, and the arts, sciences and literature of Europe, to be denominated the Elphinstone Professorships. This sum afterwards accumulated to 4,43,961 rupees, and the interest of it is augmented by an annual subscription from Government of 22,000 rupees.

“ In 1863 Cowasjee Jehangier Readymoney, Esquire, Justice of the Peace, Bombay, presented Government with one hundred thousand rupees towards erecting suitable college buildings for Elphinstone College, to be called the ‘ Cowasjee Jehangier buildings.’

“ In 1864, on account of the rise in the prices of building materials and labour, Mr. Cowasjee Jehangier added a second sum of one hundred thousand rupees to his former munificent donation.”

74. The number of successful candidates coming from the Elphinstone College to the University Examination appears to be steadily increasing. It passed seven in the First Arts Examination in 1861, and 13 in 1865. In the B. A. examination the number of successful competitors from the Elphinstone College has risen from four in 1862, to 10 in 1865, and in the M. A. Examination the number has risen from one in 1862 to four in 1865. The average attendance at the institution has also increased from 65 in 1861-62 to 78 in 1865-66. All this betokens an increasing efficiency and popularity, and the comparatively high fee rate (10 rupees per mensem) shows that education is not without a considerable money value in the eyes of those who take advantage of it.

75. The following account of the Poona College is taken from the Bombay University Calendar for 1865-66 :—

“ On the occupation of the Deccan by the British Government in 1818, it was found that a certain portion of the revenues of the Maratha State had been yearly set apart for pensions and presents to Brahmins (Dakshina). To prevent hardship and disappointment, and to fulfil the implied obligations of the new rulers, the British Government continued these payments; but, as the pensions and allowances fell in, they resolved, while maintaining the same total expenditure, under the name of the Dakshina Fund, to devote a portion of it to a more permanently useful end, in the encouragement of such kind of learning as the Brahmans were willing to cultivate. With this view the Poona College was founded in 1821 as a Sanscrit College, exclusively for Brahmans.

“ In 1837 some branches of Hindoo learning were dropped; the study of the vernacular and of English was introduced, and the college was opened to all classes; and, after having been amalgamated with the English school in 1851, it arose in its present form in 1857, by a separation of the college division from the school division. From another portion of the Dakshina Fund Dakshina fellowships have been founded, of which four, viz., one senior fellowship of 100 rupees per mensem, and three junior fellowships, each of 50 rupees per mensem, are attached to the college.

“ In 1863 Sir Jamsetjee Jejeebhoy, Bart., offered to Government the sum of one hundred thousand rupees to provide suitable college buildings for the Poona College.”

76. The Poona College passed in 1865-66, 12 students in the First Arts Examination, three in the B. A. Examination, and one in the M. A. Examination. These figures are considerably less than those already given for the Elphinstone

College : but the progress of the Poona College during recent years has been perhaps the greater of the two.

77. The Director of Public Instruction makes the following remarks in his Report of 1865-66, viz. :—

“ The Government Arts Colleges (Elphinstone and Poona) are in a good condition as regards discipline and teaching, and the humanizing influence which they exercise. Poona College has begun to gain on Elphinstone College, both in numbers and university successes. This is owing partly to the efficient condition of the Poona High School, partly to the appreciation of literary education among the Brahmans of the Deccan. It is a source of regret that Elphinstone College remains stationary in point of numbers. This I attribute partly to the recent disturbed condition of the popular mind in Bombay (on account of commercial excitement), which has been unfavourable to educational development, but especially I attribute it to the general want of feeling for literature among the Parsees, who, with all their stirring and energetic qualities, and their Europeanizing tendencies, seem to have hardly any ideas for their children beyond the desk or the counter. Except two grandsons of the Honourable Mr. Framjee Nusserwanjee Patel, there is, I think, no scion of any leading Parsee family under collegiate instruction. Looking at the matter broadly, we find that out of about 100 students who passed the matriculation examination last year, about 50 joined the Government colleges, the rest having for the most part accepted schoolmasterships and other small appointments. If the same average were continued, about 25 students per annum only would enter each of the Government arts colleges, which would give an attendance for the three years' course at each of the colleges of about 75 or 80 students.

“ But the great encouragements recently held out to university graduates by his Excellency the Governor of Bombay in Council, and by the High Court, will doubtless prove a powerful stimulant towards increasing the number of collegiate students. I refer in particular—*1st*, to a Circular Letter from the Government to the Revenue Commissioner, No. 4481, dated 31st October 1865, requesting that Mamlutdars' appointments may be, as far as possible, conferred on Bachelors of Arts; *2ndly*, to the appointment by his Excellency in Council of a Deputy Educational Inspector in the Belgaum Sub-division to be Deputy Collector; *3rdly*, to a Resolution of Her Majesty's Honourable Bench of Justices, dated 22nd June 1866, No. 932, admitting Bachelors of Laws, under certain conditions, to practise as advocates on the Original Side of the High Court; *4thly*, to the recent appointment by Government of a Bachelor of Laws, to act as Judge in the Court of Small Causes. These encouragements will do more than anything which this Department could possibly effect to promote higher education in the Presidency.”

SECTION V.

SCHOOLS.

78. It is proper to note at the outset that the statistics here given respecting schools refer only to schools managed by Government, or open to the inspection of Government officers. There are, of course, private schools in some parts of the country which receive no aid from Government, and are not open to Government inspection; but their number is quite insignificant in comparison with those managed or inspected by Government officers, to which the following statistics relate :—

Government Schools, and Private Schools open to Government Inspection—Statistics for the Year 1865-66.

	Bengal.			North-Western Provinces.		Punjab.		Madras.		Bombay.		Oude.		Central Provinces.		Mysore.		British Burma and the Berars.				
	Government Institutions.	Private Institutions.		Government Institutions.	Private Institutions.	Government Institutions.	Private Institutions.	Government Institutions.	Private Institutions.	Government Institutions.	Private Institutions.	Government Institutions.	Private Institutions.	Government Institutions.	Private Institutions.	Government Institutions.	Private Institutions.	Government Institutions.	Private Institutions.			
		Aided.	Un-aided.																			
Number of Institutions.																						
Higher Class	50	83	7	4	24	18	13	14	9	2	10	4	1	1	6	4	Owing to the very recent appointment of Directors of Public Instruction, and the organization of regular Education Departments in Burma and the Berars, no sufficient statistics are available. But a general reference to the Schools in those Provinces will be made in the body of this note.					
Middle "	117	849	92	78	71	52	68	169	165	20	34	12	105	11	9	7						
Lower "	81	1,132	73	3,097	1,768	3	17	825	1,121	69	61	36	546	680	32	15						
Female "	3	192	25	77	333	696	-	139	33	Included in above.	-	11	92	-	-	7						
TOTAL	251	2,256	197	5,320	2,196	769	98	1,147	1,328	91	105	63	744	692	47	33						
Number of Pupils attending them.																						
Higher Class	9,339	10,507	1,481	1,545	8,140	5,297	3,132	3,126	1,741	665	1,395	1,135	270	223	831	529						
Middle "	8,124	37,924	3,501	20,260	6,999	1,515	3,786	9,762	23,794	2,358	2,989	1,042	10,033	940	392	888						
Lower "	2,787	36,307	1,962	95,535	60,373	108	498	14,636	67,124	4,174	2,004	1,240	18,984	13,774	1,126	1,472						
Female "	153	5,070	489	1,494	6,834	12,727	-	3,315	Included in above.	Included in above.	-	270	2,361	-	-	345						
TOTAL	20,403	89,808	7,433	1,26,609	82,346	19,647	7,416	30,839	92,659	7,197	6,388	3,687	31,648	14,937	2,349	3,234						
Expenditure.																						
Higher Class	2,00,328	56,058	Not given.			1,08,983	18,333	33,996	76,321	1,923	32,876	28,777	10,945	1,650	21,878	13,435						
	1,95,108	1,30,850				8,892	35,541	29,894	15,953	87,303	49,922	31,664	5,425	15,910	1,260	3,733	-	16,650				
Middle "	45,405	1,51,169				60,633	77,320	19,924	14,087	37,969	50,204	1,03,346	30,113	26,753	3,829	50,080	9,541	9,609	5,070			
	19,863	2,49,608				28,130	1,01,833	12,080	16,812	9,355	1,31,724	1,36,274	98,191	10,151	6,566	39,433	10,438	-	3,567			
Lower "	12,549	57,595	62,203	13,815	22,874	319	2,954	17,189	1,74,636	7,459	Nil	2,409	689	428	7,581	3,986						
	2,720	62,661	1,73,153	2,49,583	1,51,277	263	-	14,733	2,03,651	98,431	5,082	4,963	1,09,092	18,685	-	4,346						
Female "	7,410	30,528	20,698	14,460	10,487	25,100	-	5,617	Included in above.	Included in above.	-	2,726	83	-	-	3,070						
	35	50,570	7,377	15,696	13,694	16,495	-	32,820	-	-	-	8,692	11,942	-	-	4,929						
TOTAL	2,65,692	2,95,350	2,52,517	1,23,928	1,75,073	93,869	1,44,909	1,07,006	3,54,303	39,495	59,629	37,741	61,797	11,619	39,068	25,561						
	2,17,726	4,93,589	2,17,552	4,02,653	2,06,945	1,12,874	25,338	2,66,580	3,89,847	2,28,286	20,658	36,131	1,61,727	32,856	-	29,492						
GRAND TOTAL	4,83,418	7,88,939	-	5,26,581	3,82,018	2,06,743	1,70,247	3,73,586	7,44,150	2,67,781	80,287	73,872	2,23,524	44,475	39,068	55,053						

79. It should be explained here that the classification of schools into "higher," "middle," and "lower" classes made by the educational authorities of the different Presidencies and Provinces has been somewhat altered by me.

80. "Higher class" schools are those which educate up to the university entrance standard; and although in some cases schools may have been included by the local educational authorities in this class, with reference rather to a professed ability to educate up to that standard than to actual results, the classification may, perhaps, be accepted as sufficiently correct; and I have not therefore altered it.

81. But the distinction between middle class and lower class schools has never been very precisely laid down, and hence different principles of classification have been adopted by the local authorities, which I have found it necessary to alter, in order to preserve uniformity. The resolution of the Government by which the classification was directed, described the middle class as "composed of schools which do not educate up to the university standard, but which are above the schools designed for the education of the masses," and the "lower class" as "composed of schools located in villages, towns, &c., and designed primarily for the education of the masses."

82. In Bengal the "lower class" has been made to include only the "strictly elementary" schools, in which instruction is "conveyed exclusively in the vernacular," and is "mainly confined to reading, writing, and simple arithmetic," all other schools, whether vernacular or Anglo-vernacular (not being institutions educating up to the university standard), being entered under the "middle class." This is, perhaps, on the whole, the best principle of classification; and it appears to have been carried out in all Provinces except the North-Western Provinces, Oude, and the Central Provinces, where the tehsil or town schools have been wholly or partly entered in the lower class. As these schools all provide a more than elementary vernacular education, I have transferred them to the head of "middle class schools."

83. Too much importance must not, however, be attached to the classification of schools, for, apart from mere errors of classification, it is obvious that any classification based on the standards up to which the various kinds of schools profess to educate, must be, more or less, liable to mislead. An Anglo-vernacular school, for instance, may have a few advanced pupils preparing for the university entrance standard, entitling it to be ranked as a higher class school; but the great bulk of its pupils may be under education of a very much lower kind, and a considerable number may be under tuition of the most elementary character. Yet all these pupils will be shown as belonging to a higher class school. Attempts are, however, being made in some parts of the country (especially, perhaps, in Bombay) to draw a clear line of distinction between the different grades of schools, and to make the education in one grade commence where the education of the next lower grade of schools ends; and it will, perhaps, be time enough, when some progress has been made in this respect, to consider the propriety of altering the statistical forms.

84. I proceed to offer a few remarks respecting the schools of each class included in the statement given above.

SCHOOLS—HIGHER CLASS.

Bengal.

Tezpore (Dur-
rung).
Nowgong.
Chyebassa (Singh-
boom).
Házareebagh.

85. In Bengal the 50 Government higher class schools consist of 11 collegiate and branch schools attached to or in connection with the colleges, and of 36 zillah schools. Four zillah schools were established during 1865-66 at the places marginally noted, thereby supplying with Government zillah schools the only four districts in Bengal which, till then, were without them. Three of the existing schools (at Gowalpara, Rungpore, and Darjeeling) were at the same time placed on an improved footing; and the Gowhatty School was raised to the status of what the Director of Public Instruction calls a "high school," by which he means an institution capable of educating up to the "First arts" standard of the university, the Government assignment being increased from

2,666 rupees

2,666 rupees to 12,000 rupees per annum. A similar elevation of status has quite recently been proposed in respect of the Cuttack zillah school. The undergraduate classes of such institutions belong more properly to the statistical heading of "college students," and I believe that the Director of Public Instruction intends to adopt this classification in future. One of the Bengal higher class schools, called the Collingah branch school (a branch of the Presidency College), was, until recently, a purely Mahomedan institution. During 1865-66, however, it was thrown open to all classes, the fee rate being fixed at four rupees per mensem for all pupils other than Mahomedans, for whom the previous fee rate of one rupee was continued.

86. The following figures will give some idea of the working cost of higher class schools in Bengal in 1865-66 :—

	Government Schools.	Private Schools (aided).
Number of Institutions - - - - -	50	83
Average number of pupils . - - - -	8,540	9,738
	<i>Rs.</i>	<i>Rs.</i>
Cost charged to Imperial funds - - - -	2,00,328	56,058
„ to other sources of income - - - -	1,95,108	1,30,850
TOTAL - - - <i>Rs.</i>	3,95,436	1,86,908
Average total annual cost per pupil - - - -	46	19
Average annual cost to Government per pupil - -	23	5
STATISTICS RESPECTING FEES:		
Total amount of fees, fines, &c., realised from pupils during the year - - - - -	1,65,105	86,317
Average ditto per pupil - - - - -	19	8½

PUPILS.

	Hindoos.	Mahomedans.	Others.
Government Schools - - - - -	7,856	1,222	98
Private Schools - - - - -	8,972	339	312
TOTAL - - -	16,828	1,561	410

87. It thus appears that the annual cost of educating each pupil in the Government schools of the higher class in Bengal is 46 rupees. Of this, the Imperial revenue is charged with exactly one-half (23 rupees), the remainder being defrayed from local sources, such as endowments, subscriptions, fees, &c. It is satisfactory to note that by far the greater portion of the local income in Government schools is derived from fees, and this source of income may be expected to increase not only with the number of pupils, but with the development of an appreciation among the Natives of the advantages of a good education, which will render it possible and proper to raise the fee rate.

88. The cost of education in private schools of the class under notice is, as will be seen, much less than in Government institutions. That this should be

the case is not surprising, and it may be noted, as a partial explanation, that the private institutions do not generally come up to the same high average standard as the Government schools. This is evident from the university returns. The average fee per pupil in aided schools (*Rs.* 8. 13.) is much less than the average fee (19 rupees) in Government schools; but the proportion borne by the fee income to the total expenditure in aided schools (46 per cent.) is rather more than the proportion (43 per cent.) in Government schools.

89. The division of pupils into Hindoos, Mahomedans, &c., shows that there are about 11 Hindoos attending higher schools in Bengal for every Mahomedan.

90. The university returns bear strong evidence of the successful working of the higher class schools in Bengal. The average number of Bengal students who have passed the entrance examination in the last four years (1862-63 to 1865-66) is 521. The following details of the results of the examination for 1865-66 may be given:—

UNIVERSITY ENTRANCE EXAMINATION.

Bengal Students.

December 1865.	Number of Candidates.	Number Passed.		
		First Division.	Second Division.	Total.
Government Schools	548	30	191	221
Private Schools (aided)	549	12	152	164
" " (unaided)	174	3	40	43
Schoolmasters	17	-	2	2
Private Students	33	-	3	3
TOTAL	1,321	45	388	433

North-Western Provinces.

91. The nine higher class schools of the North-Western Provinces consist of the school departments of the three Government colleges at Agra, Benares, and Bareilly; of the Government schools at Ajmere and Etawah; and of the school departments of the four private colleges—one at Benares, and three at Agra. A brief reference has already been made in Section I. to the steps which have been taken for establishing 21 zillah schools in the North-Western Provinces, in lieu of the two middle-class institutions now existing. The majority of these institutions will, doubtless, at first starting, take rank as middle-class institutions; but some will, I imagine, from the outset, be equipped in a manner enabling them to educate up to the university entrance standard, and will, therefore, rank as higher class schools. All of them ought eventually to be brought up to this standard. The establishment of zillah schools in the North-Western Provinces is a noticeable point in the history of education in those provinces. The want of such schools was a marked feature of the organization; the education department holding to the idea of the gradual development of educational progress from below (the very opposite of the Bengal idea), and objecting to establish zillah schools till the schools of a lower grade had developed a desire for higher education, and supplied the requisite material in the way of pupils qualified to benefit by such education. The step now taken may perhaps have been a little too long delayed, but the good substratum laid in past years, in the shape of efficient schools of a lower class, will, doubtless, make the development of the new zillah schools all the more rapid and substantial.

92. The following figures give statistical information for 1865-66, respecting the higher class schools of the North-Western Provinces, similar to those already given for Bengal :—

	Government Schools.	Private Schools.
Number of Institutions - - - - -	5	4
Average number of pupils - - - - -	1,416	1,006*
	<i>Rs.</i>	<i>Rs.</i>
Cost charged to Imperial Funds - - -	1,08,983	18,333*
„ to other sources of income - - -	8,892	35,541*
TOTAL - - - <i>Rs.</i>	1,17,875	53,874*
Average total annual cost per pupil - - -	83	53*
„ annual cost to Government per pupil -	76	18*
STATISTICS RESPECTING FEES.		
Total amount of fees, fines, &c., realised from pupils during the year - - - - -	13,584†	12,122*
Average ditto per pupil - - - - -	8½†	12*

PUPILS.

	Hindoos.	Mahomedans.	Others.	
Government Schools -	1,487	166	19	Including College Department Returns : separate Returns not being available.
Private Schools - -	873	209	107	
TOTAL - -	2,360	375	126	

93. While in Bengal the average cost of each pupil in Government higher class schools was only 43 rupees (of which 23 rupees were paid by Government), in the North-Western Provinces the average cost is 83 rupees (of which 76 rupees were paid by Government). The cost per pupil in private schools is in like proportions higher in the North-Western Provinces than in Bengal. The cause of this is not, as might be supposed, that the Bengal schools are better filled, making the average cost of each pupil less; for, in point of fact, the schools in the North-Western Provinces have a larger attendance. The inference is, that the expenditure in the institutions of the North-Western Provinces is on a much higher scale than in Bengal.

94. The following figures, in respect of fees, will show more clearly how matters stand :—

NORTH-WESTERN PROVINCES.		Average Fee.
		<i>Rs. a.</i>
Government Collegiate Institutions - - - -		11 8 per annum.
Government Schools of the Higher Class - - -		2 15 „
Private Collegiate Institutions - - - - -		12 - „

* *Note.*—The statistics in respect of the private schools include those of the college departments. The local statements do not show them separately.

† *Note.*—These figures include the college returns, there being no separate returns for the school department available.

The small fee of *Rs.* 2. 15. per annum, or barely four annas per month in the two schools, is noticeable. Even the fee in the collegiate institutions is small.

There were 28 students from the North-Western Provinces who passed the university entrance examination in 1865; of these, nine passed in the first division.

Punjab.

95. The 42 higher-class schools, entered in the Punjab column of the statement already given, consist of 24 Government Zillah schools and 18 private institutions, of which all but three are seminaries maintained and managed by missionary bodies. It seems probable that the Punjab Director of Public Instruction makes out the list of higher class schools with reference rather to expectations than to actual result. He may, perhaps, have satisfied himself that each of the 42 institutions is really able to educate up to the university standard,—although in that case it would be difficult to deny that the means of education supplied are in advance of the ability of the pupils to take advantage of them. But, whatever may be the explanation, certain it is that, notwithstanding the existence of 42 higher class schools, the Punjab could count only 23 successful candidates at the university entrance examination of 1865-66. There were actually more successful candidates from the North-Western Provinces, with its nine higher class schools, than from the Punjab with its 42 institutions.

96. The following statement gives statistical information respecting higher class schools in the Punjab, corresponding to that already given for Bengal and the North-Western Provinces:—

	Government Schools.	Private Schools.	Private Schools, excluding Three Institutions for European Children.
Number of Institutions - - -	24	18	15
Average number of pupils - - -	6,610	4,061	3,896
	<i>Rs.</i> <i>a.</i>	<i>Rs.</i> <i>a.</i>	<i>Rs.</i> <i>a.</i>
Cost charged to Imperial funds - - -	1,21,788 -	54,363 -	29,684 -
„ „ to other sources of income - -	29,894 -	79,304 -	44,642 -
TOTAL - - - <i>Rs.</i>	1,51,682 -	1,33,667 -	74,326 -
Average total annual cost per pupil - -	23 -	32½ -	19 -
Average annual cost to Government per pupil - - - - -	18 -	13 -	7 -
STATISTICS RESPECTING FEES.			
Total amount of fees, fines, &c., realised from pupils during the year - - -	11,264 -	30,551 -	3,518 -
Average ditto per pupil - - - -	1 11	7 7	- 14

PUPILS.

	Hindoos.	Mahomedans.	Others.
Government Schools - - - -	5,926	1,874	340
Private Schools - - - -	3,451	1,488	358
TOTAL - - -	9,377	3,362	698

I have added a column showing the results in respect of private schools, excluding three institutions for European children, as the inclusion of the latter interferes with the use of the statistics.

97. The cost of Zillah school education in the Punjab is very moderate, being only half the amount per pupil shown in the Bengal Returns. But the much higher class of education (as shown by the University Returns) given in the Bengal institutions, and the preponderance of lower class pupils in the Punjab schools fully accounts for the difference.

98. The average fee realised from each pupil in the Punjab higher class schools is extremely small, being only $2\frac{1}{4}$ annas per mensem, while in private schools for natives it is only $1\frac{1}{2}$ anna per mensem. The attention of the Punjab Education Department was, as the Government is aware, drawn to this point some time ago, but there has not apparently been any material improvement up to 1865-66. It is true that the Director of Public Instruction states in his Report for 1865-66 that the amount collected as fees "continues to increase favourably," and he gives statistics which show, that while the fee collections in Government Zillah schools were only 4,690 rupees in 1862-63, they had reached 11,264 rupees in 1865-66; but it is nevertheless a fact that the average rate per pupil in 1865-66 is actually slightly *less* than the average in 1862-63. The matter obviously requires further attention on the part of the Director of Public Instruction in the Punjab.

99. The large increase which of late has taken place in the number of pupils attending Zillah schools in the Punjab is due principally to the adoption of what is called the "branch school system." This system was described as follows in the Report of 1863-64 :—

"The immense increase in attendance shown above has been produced chiefly by the opening of branches to the Zillah schools, as noticed in paragraph 38 of my last annual report. Commenced at Delhi, the system has been there carried out very completely, and has been gradually extended to other places. It is very economical, and decidedly efficient and popular. We can never depend upon more than a small percentage of the boys, who enter our schools in the lowest class, staying until they reach the highest class, and pass the university entrance examination. The only way, then, to secure the full number in the highest class, which a single master can manage, say from 20 to 25 boys, is to have at least 800 boys all under instruction. The plan followed as a rule, is to let all beginners attend in the branch schools, which are located in the most convenient places all about the city or suburbs. The numbers in the main school are then kept up to the full limit that the main building can hold, and the main staff of masters can manage, by drafting into it the best of the branch scholars. Eventually these branch schools will, it is hoped, bring their pupils through the first or lower half of the whole school curriculum; after which four years passed in the main school will bring a scholar up to the matriculation standard."

The system is described in subsequent Reports as continuing to work most satisfactorily.

Madras.

100. The 27 higher class schools in Madras consist of 13 Government and 14 private institutions. The Government institutions comprise the Collegiate School attached to the Presidency College, three provincial schools (at Combaconum, Bellary, and Calicut), eight Zillah schools, and the Madrissa-i-Azam.

101. Respecting the provincial schools, it may be mentioned that they were originally designed to contain nine classes, of which the six lower were to constitute a school department, educating up to the university standard, and the three higher to constitute a college department. The college classes, however, have never as yet been organised, though it is stated in the Report for 1865-66 that sanction had been obtained for raising the Combaconum school (which is by far the most advanced of the three) to the originally intended status.

102. The Madrissa-i-Azam is of interest, principally owing to its being one of the few institutions in India designed specially for the instruction of the Mahomedan population in Arabic literature. I shall, therefore, reserve my notice of it for a future section (VII.) of this note.

103. The 14 private schools of the higher class in Madras are, with three exceptions, institutions maintained and managed by missionary bodies.

104. The following statement contains information for 1865-66 respecting higher class schools in Madras, similar to that already given for other Provinces :—

	Government Schools.	Private Schools.
Number of Institutions - - - - -	13	14
Average number of pupils - - - - -	2,821	2,834
Cost charged to Imperial funds - - - - -	<i>Rs.</i> 1,03,986 <i>a.</i> -	<i>Rs.</i> 33,996 <i>a.</i> -
„ to other sources of income - - - - -	15,983 -	87,303 -
TOTAL - - - <i>Rs.</i>	1,19,969 -	1,21,299 -
Average total annual cost per pupil - - - - -	42 -	42 -
Average annual cost to Government per pupil - - - - -	36 -	12 -
STATISTICS RESPECTING FEES.		
Total amount of fees, fines, &c., collected from pupils during the year - - - - -	29,105 -	19,782 -
Average ditto per pupil - - - - -	10 5	6 15

PUPILS.

	Hindoos.	Mahomedans.	Others.
Government Schools - - - - -	2,654	353	214
Private Schools - - - - -	2,409	120	625
TOTAL - - - - -	5,063	473	839

There is nothing particularly worthy of note in the above-mentioned statistics, except that the average fee (about 13 annas per month) is lower than it ought to be.

105. Of the 229 successful candidates of the matriculation examination, 120 came from Government institutions, and 109 from private institutions.

Bombay.

106. Of the 11 schools of the higher class in Bombay, nine are Government institutions and two private institutions.

107. Great attention has been paid of late in Bombay to the organization of a really efficient system of high school education. It may almost be said that until recently there were no higher class schools at all in Bombay, except the Elphinstone and Poona Colleges, which took the place of this class of institutions.

108. In an interesting memorandum, written by Mr. Howard (late Director of Public Instruction, Bombay) in June 1865, he described at length the utter absence of anything like a good high school organisation, and the efforts that had

had been made to introduce such an organisation. The following remarks may be quoted from his pamphlet:—

“The first matriculation examination showed beyond doubt that this was true. All the Central School boys failed; all the Poona School boys failed; all the other school-boys in the Presidency failed. Only college men passed the test; and though 21 candidates passed from the two colleges, a much larger number were rejected.

“In subsequent examinations, however, some boys matriculated from Government schools. Each year their number has steadily increased; and it may now be hoped that the difficulty of supplying undergraduates to the university has been, or shortly will be, surmounted. Recent grants of public money, have made it possible to furnish the Central and Poona schools with a fairly sufficient staff. The English schools at Ahmedabad, Surat, Belgaum, Rutnagherry, Hyderabad, and Dhoolia, have been strengthened and raised to the high school rank. Exhibitions have been founded to be held in high schools, by promising boys from the districts and perhaps, more than all, the Native graduates, whose numbers are yearly increasing, are taking their place as masters in the local schools, to which they bring the method, the culture, and the corporate spirit of the university.”

109. The following extract from the “Bombay Education Report” for 1865-66, will give some idea of the success attained in the organisation of good high schools:—

“The numerical prosperity of the colleges, and, through them, of the University of Bombay, will thus entirely depend on the number of students who pass the matriculation examination—in other words, on the efficiency of the high schools. I have shown above (paragraph 23) 70 as the aggregate number of matriculations from our high schools in 1865-66. This stands against 49 in 1864-65; 24 in 1863-64; 10 in 1862-63; 5 in 1861-62; 8 in 1860-61; and 0 in the two first years of the university examinations. Such progress is, so far as it goes, satisfactory; but it rather points to the utter weakness of our high schools in former years, than to any great strength in their present condition. Every high school that is worthy of the name ought to matriculate at least 20 boys every year; and large schools, like the Elphinstone and Poona high schools, ought to pass annually about double that number. Our nine high schools ought thus to give us more than 200 matriculations each year, though I fear this result will not be realized for some time.”

110. A brief description of the several schools is given in the following extract from the same Report:—

“Of all our high schools, that of Poona is in the most satisfactory condition (see the Report of the Educational Inspector, Central Division, in Appendix A, 1). The results of the matriculation examination, and the general discipline and management of the schools, reflect much credit on Mr. Kirkham, the head master. Elphinstone high school has suffered from the agitation of the share-mania in Bombay, from numerous changes in its staff of masters, and from the unliterary tendencies of Parsees and Parbhooos and other non-Brahminical castes, who form the main bulk of the pupils. This school requires a strong hand to reduce it to a proper state of discipline. The high schools of Ahmedabad and Surat, are in a poor and backward condition. One of the chief difficulties they have to contend with, is the want of Gujarati graduates to be employed as teachers. Only five Gujarati Hindoos have as yet graduated in the University of Bombay, of whom one is engaged in mercantile pursuits, and one is deceased. Belgaum (Sirdars’) high school has hitherto been chronically depressed by the privilege claimed by the neighbouring Sirdars of nominating boys for admission without regard to their previous preparation. But this claim has now been waived, and henceforth the standard of the high school entrance examination is to be enforced. Rutnagherry high school had been thoroughly disorganised by the late head master,—a certificated schoolmaster who was sent out from England four years ago with the highest testimonials, but who proved quite incompetent for his novel duties. The regeneration of the school has been vigorously commenced by Mr. Ramkrishna Gopal Bhandarkar, M. A., of the University of Bombay, to whom much credit is due for his year’s administration. Dhoolia high school was up to February last mismanaged by its European head master (formerly a private soldier in the Inniskillen Dragoons); it has now been placed under Mr. Vitthal Patak, M. A., a pupil of the Reverend Dr. Wilson, and from his administration a speedy improvement of the school is looked for. The Hyderabad and Kurrachee high schools are really middle class schools, with a small high school element in each. Superior education in the province of Scind, is as yet quite incipient.”

111. The two private schools* of the higher class are both Parsee institutions, situated

* Sir Jamsetjee Jeejeebhoy Parsee Benevolent Institution. Proprietary School.

situated in the town of Bombay; the former is supported mainly by an endowment, the latter mainly by school fees.

112. The following statement gives statistical information for 1865-66, respecting higher class schools in Bombay, corresponding to that already given for other Provinces:—

	Government Schools.	Private Schools.
Number of Institutions - - - - -	9	2
Average number of pupils - - - - -	1,576	551
Cost charged to Imperial funds - - - - -	<i>Rs.</i> 76,321 -	<i>Rs.</i> 1,923 -
„ to other sources of income - - - - -	49,922 -	31,664 -
TOTAL - - - <i>Rs.</i>	1,26,243 -	33,587 -
Average total annual cost per pupil - - - - -	80 -	60 -
Average annual cost to Government per pupil - - -	48 -	3½ -
STATISTICS RESPECTING FEES.		
Total amount of fees, fines, &c., realised from pupils during the year - - - - -	28,996 -	11,245 -
Average ditto per pupil - - - - -	18 -	20½ -

PUPILS.

	Hindoos.	Mahomedans.	Parsees.	Others.
Government Schools - - - - -	1,335	28	304	74
Private Schools - - - - -	2	-	663	—
TOTAL - - -	1,337	28	967	74

There is nothing particularly calling for notice in the above statistics. The cost per pupil is certainly high, nearly as high in fact as in the North-Western Provinces (83 rupees per pupil in Government schools), respecting which remarks have already been made. But there is much in the local circumstances of Bombay which explains the high cost of education. The expense of living is exceptionally high, and the salaries of the masters are of necessity somewhat in excess of those given in other Presidencies. The comparatively recent organisation of some of the high schools has also something to do with the high cost per pupil: and it may be hoped that, in future years, an increased number of pupils will make the cost per head less.

The average fee realised from pupils on the Government institutions, is nearly as large as in Bengal.

Oude.

113. The 14 higher class schools in Oude, consist of 10 Government zillah schools and four private schools.

114. Of the 10 zillah schools, five were established in 1863-64, the remaining five, which had been previously in existence, though on a lower scale, having been re-organised in the same year.

115. The

115. The classification of these zillah schools has reference rather to their prospective ability to educate up to the university entrance standard than to actual results. Education of a higher class in Oude is of so recent an origin, that the higher classes of these schools are not yet filled. It was only in two of these schools (Fyzabad and Oonao) that there were classes preparing for the university entrance examination in 1865-66. But the Director of Public Instruction says that they are all "steadily working up towards the university entrance standard."

116. Of the four private schools, three are missionary institutions, and the other (the principal educational institution in the province) was founded by the Oude talookdars, and called the "Canning College." It has, I believe, been recently affiliated to the university; but for the year under review (1865-66) it stands in the list of higher class schools. It gets a grant from Government of 25,000 rupees per annum (although only 22,799 rupees were drawn in 1865-66), the other moiety of the required funds being subscribed by the talookdars and others. It sent up six successful candidates to the university examination in 1865-66.

117. The following statistics will give some idea of the progress already made in higher class education in Oude; and, considering the very recent organisation of the schools, it must be admitted to be most satisfactory:—

	Government Schools.	Private Schools.	Private Schools, excluding the "Canning College."
Number of Institutions - - - -	10	4	3
Average number of pupils - - - -	1,089	720	374
	<i>Rs. a.</i>	<i>Rs. a.</i>	<i>Rs. a.</i>
Cost charged to Imperial funds - - -	32,876 -	28,777 -	5,978 -
" to other sources of income - - -	5,425 -	15,910 -	7,398 -
TOTAL - - - Rs.	38,301 -	44,687 -	13,376
Average total annual cost per pupil - -	35 -	62 -	35 -
" annual cost to Government per pupil - - - - -	30 -	39 -	16 -
STATISTICS RESPECTING FEES.			
Total amount of fees, fines, &c., realised from pupils during the year - - -	1,605 -	3,109 -	420 -
Average ditto per pupil - - - -	1½ -	4½ -	1 2

PUPILS.

	Hindoos.	Mahomedans.	Others.
Government Schools - - - -	1,064	324	7
Private Schools - - - -	778	331	26
TOTAL - - -	1,842	655	33

There is nothing particularly noticeable in the above statistics, except the very small amount of average fee realised from the pupils, both in the Government schools and in the private schools (excluding the Canning College). The very recent organisation of the schools is a sufficient reason, perhaps, for the present, but attention should be directed to the subject as education comes to be better appreciated and more valued by the people.

118. The Chief Commissioner has recently obtained the sanction of Government to increasing the teaching staff in six of the more forward zillah schools; and it may be hoped that the more advanced standard of education, to be given in them, will render it possible to impose a higher fee rate.

Central Provinces.

119. Of the two schools of the higher class in the Central Provinces, one (at Saugor) is a Government institution, and the other (at Jubbulpore) a missionary institution.

120. The Director of Public Instruction has properly confined his list of higher class schools to those which actually do educate up to the university entrance standard, leaving the other nine zillah schools to be entered as middle class schools. This fact ought to be noticed, for otherwise a comparison unfavourable to the Central Provinces might be drawn from the greater apparent development of this class of schools in the Punjab and Oude, where evidently the classification has been based rather on a standard hoped to be attained, than on one actually worked up to.

121. The Saugor School might, strictly speaking, have been included in the list of colleges; for it is an affiliated institution, and passed one student last year in the first arts examination. It has recently had a Sanscrit professor added to its staff, and will, doubtless, appear next year in the list of colleges. The school has not prospered much during the last nine years. In that period the number of pupils has decreased from 356 to 270, a result which the Director ascribes to a faulty system of education prevailing in the institution. It has recently been re-organised, and better results are looked for. Since its affiliation, the school has passed eight students in the entrance examination (three during the last year).

122. The following extract gives information for 1865-66 respecting the two higher class schools in the Central Provinces, similar to that already given for other Provinces:—

	Government Schools.	Private Schools.
Number of Institutions - - - - -	1	1
Average number of pupils - - - - -	249	200
	<i>Rs. a.</i>	<i>Rs. a.</i>
Cost charged to Imperial funds - - - - -	10,945 -	1,650 -
„ to other sources of income - - - - -	1,260 -	3,733 -
TOTAL - - - - - <i>Rs.</i>	12,205 -	5,383 -
Average total annual cost per pupil - - - - -	49 -	53 -
„ annual cost to Government per pupil - - - - -	43 -	16 -

STATISTICS RESPECTING FEES.

Total amount of fees, fines, &c., realised from pupils }
during the year - - - - - } Not given in Central Provinces
Average ditto per pupil - - - - - } Returns.

PUPILS.

Hindoos. Mahomedans. Others.

Government Schools - - - - - }
Private Schools - - - - - } Not given in Central Provinces
Returns.

The absence in the Central Provinces Education Report of the usual educational statistics according to the prescribed forms, makes it impossible to

to complete the information given in other cases. The attention of the Director of Public Instruction in the Central Provinces should be drawn to the omission.

Mysore.

123. Of the 10 higher class schools in Mysore six are Government institutions, and four private institutions. Out of the whole 10, only one (Bangalore High School) has yet passed any students in the University entrance examination. The Director of Public Instruction, however, says, that they "educate up to the University standard," and classifies them accordingly.

124. The Bangalore High School is reported to be making very satisfactory progress. The fees have been again raised, but the number of pupils still increase. There are now 503 on the rolls. The institution sent up eight successful candidates to the Matriculation Examination in 1865-66.

125. Statistics, corresponding to those already given in respect of the higher class schools of other Provinces, are here given for Mysore, so far as they can be got from the very meagre Report of the Director of Public Instruction in that province:—

	Government Schools.	Private Schools.
Number of Institutions - - - - -	6	4
Average number of pupils - - - - -	697	435
Cost charged to Imperial funds - - - - -	<i>Rs.</i> 21,878 <i>a.</i> -	<i>Rs.</i> 13,435 <i>a.</i> -
„ to other sources of income - - - - -	- -	16,650 -
TOTAL - - - - <i>Rs.</i>	21,878 -	30,085 -
Average total annual cost per pupil - - - - -	31 -	69 -
„ annual cost to Government per pupil - - -	31 -	30 -

STATISTICS RESPECTING FEES.

Total amount of fees, fines, &c., realised from pupils }
during the year - - - - - } Not given in Mysore Report.
Average ditto per pupil - - - - - }

PUPILS.

Government Schools - - - - - }
Private „ - - - - - } } Not given in Mysore Report.
Hindoos. Mahomedans. Others.

The attention of the Director of Public Instruction, Mysore, has already been drawn to the necessity of submitting more ample education statistics.

British Burmah and the Berars.

126. There are not as yet any higher class schools in either of the provinces noted above; but the recent organization of regular education departments in those provinces will probably lead to the elevation to that standard of some of the existing middle class schools.

SCHOOLS—MIDDLE CLASS.

Bengal.

127. As already explained, middle class schools in Bengal are composed partly of English and partly of vernacular institutions. The following statement contains information respecting them :—

	Government Schools.	Private Schools.	
		Aided.	Unaided.
Number of Institutions - { English - Vernacular	10	268	54
	107	581	38
	117	849	92
Average number of pupils - - -	7,635	35,781	(not given.)
Cost charged to Imperial funds - -	Rs. a. 45,405 -	Rs. a. 1,51,169 -	
„ to other sources of income -	19,863 -	2,49,608 -	
TOTAL - - - Rs.	65,268 -	4,00,777 -	
Total annual cost of education per pupil -	8½ -	11 -	
Annual cost to Government per pupil -	5¾ -	4 -	
STATISTICS RESPECTING FEES.			
Total amount of fees, fines, &c., realised from the pupils during the year - -	19,240 -	1,01,639 -	
Average ditto per pupil - - -	2½ -	2¾ -	

PUPILS.

	Hindoos.	Mahomedans.	Others.
Government Schools - - -	6,941	1,029	154
Private Schools - - -	33,955	3,212	759
TOTAL - - - Rs.	40,896	4,241	913

North-Western Provinces.

128. The 343 middle class schools in the North-Western Provinces consist of two Government Anglo-vernacular schools (Allyghur and Shahjehanpore), 263 Tehsil schools, and of 78 private aided schools. The private schools all appear to be Anglo-vernacular; 47 of them, although designated private schools, are in reality English classes attached to Government vernacular schools, and supported half by Government and half by subscriptions; the management of the English classes remaining in the hands of Government. The remaining 31 private schools are, for the most part, mission schools.

The

The following statistics respecting middle class schools in the North-Western Provinces are given :—

	Government Schools.	Private Schools.
Number of Institutions - - - - -	265	
Average number of pupils - - - - -	17,801	7,958
	<i>Rs. a.</i>	<i>Rs. a.</i>
Cost charged to Imperial funds - - - - -	60,633 -	77,320 -
„ to other sources - - - - -	28,130 -	1,01,833 -
TOTAL - - - <i>Rs.</i>	88,763 -	1,79,153 -
Total annual cost of education per pupil - - -	5 -	22 -
Annual cost to Government „ - - -	3 -	9 -
STATISTICS RESPECTING FEES.		
Total amount of fees, fines, &c., realized from the pupils during the year - - - - -	12,652 -	(not available.)
Average ditto per pupil - - - - -	- 11	

PUPILS.

	Hindoos.	Mahomedans.	Others.
Government Schools - - - - -	13,783	3,380	236
Private „ - - - - -	(not available)		

129. It will be observed that the statistics respecting private schools are not complete. This is owing to the confused way in which the Statistical Tables attached to the Education Report of the North-Western Provinces have been prepared, and to the existence of serious discrepancies. For instance, at page 40 of the Report, the Director shows 78 middle class private schools, and 43 lower class private schools aided by Government: all of which are, in the Statistical Table, shown as “private schools of the higher class.” The list of 47 Anglo-vernacular schools, given at page 42 of the Report, is represented by 50 schools in the Statistical Table. Greater care is required in future on the part of those who compile the tables; for, if these statistics are to be of any use, it is obviously necessary that they should be prepared in a clear and accurate form.

The smallness of the fee receipts, averaging scarcely one anna per mensem from each pupil, is noticeable.

Punjab.

130. The 123 middle class schools in the Punjab consist of 71 Government schools and 52 private schools. The Government schools are all designated “town schools,” being vernacular institutions situated in towns in the proportion of about one to each pergunnah. They are intended to “impart as liberal an education as can well be given through the medium of the vernacular.” Of the 52 private schools, 40 are elementary English schools connected with Government vernacular ones, but supported on the grant-in-aid principle.

131. The Punjab Town Schools are stated to have been greatly improved of late years, by the adoption of what is called the "pupil teacher system." The system was described as follows, in the Report of 1862-63 :—

Para. 56.—"In the Umballah circle, Lieutenant Holroyd has extended the pupil teacher system in large vernacular schools, as far as funds and the attainments of the boys would permit; so that, in some places, they have been substituted for assistant teachers in sufficient numbers to allow of each class having a separate pupil teacher. Thus all the classes receive more attention; attendance is increased by the popularity of the measure; emulation is excited, and an incentive to study afforded as the appointments are thrown open to competition. The best boys are also kept longer at school than they would otherwise be likely to remain; and from them candidates can be selected for instruction in the Normal schools, who stand every chance of turning out first-rate teachers eventually. Examinations of the senior vernacular scholars of districts have accordingly been held by Lieutenant Holroyd at various sudder stations, and selections of pupil teachers made from the best candidates. In Ferozepore, no less than 18 were thus appointed after an examination of this kind. Under really good teachers, the appointment of pupil teachers is no doubt preferable to the maintenance of an assistant on a high salary, and may be effected at a very little more expense."

The system has been largely extended in subsequent years, principally in the Umballah circle.

132. The following statistics respecting middle class schools in the Punjab are given :—

	Government Schools.	Private Schools.
Number of Institutions - - - - -	71	52
Average number of pupils - - - - -	5,852	1,267
Cost charged to Imperial funds - - - - -	<i>Rs.</i> 19,924 -	<i>Rs.</i> 14,087 -
" to other sources - - - - -	12,080 -	16,812 -
TOTAL - - - - - <i>Rs.</i>	32,004 -	30,899 -
Total annual cost of education per pupil - - - - -	5½ -	24 -
Annual cost to Government per pupil - - - - -	3½ -	11 -
STATISTICS RESPECTING FEES.		
Total amount of fees, fines, &c., realized from the pupils during the year - - - - -	1,330 -	986 -
Average ditto per pupil - - - - -	- 3¾	- 12

PUPILS.

	Hindoos.	Mahomedans.	Others.
Government Schools - - - - -	4,717	1,884	398
Private Schools - - - - -	1,067	354	94
TOTAL - - - - - <i>Rs.</i>	5,784	2,238	492

133. The extremely small average fee realized from each pupil in the Government town schools is noticeable. A fee of scarcely four pie per mensem, is surely a miserably small payment by the children of townspeople for a good vernacular education. The matter requires attention.

Even in the private schools, which, as already explained, are for the most part grant-in-aid English classes attached to Government vernacular schools, and managed by Government, the fees, though larger, are very small. One
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anna per mensem, is a mere nominal payment for an English education. The high total annual cost per pupil (24 rupees) in these private schools is also noticeable.

Madras.

134. Of the 237 middle class schools in Madras 68 are Government institutions, and 169 private institutions. The Government institutions are designated either Anglo-vernacular schools or talook schools, the difference being, that the former are of a higher grade, nearly approaching to the zilla schools, while the latter are of somewhat less pretensions, the prescribed course of study being described as "sufficient to impart a good scholar-like knowledge of the vernacular language of the pupils, a fair acquaintance with the English language, a good knowledge of arithmetic, and of the elements of geometry and algebra, a fair knowledge of general geography, and of the leading facts of the histories of India and of England, and some acquaintance with the outlines of astronomy, and the leading principles of political economy."

The private middle-class schools in Madras are for the most part mission schools.

135. The following statistics respecting middle-class schools in Madras are given:—

	Government Schools.	Private Schools.
Number of Institutions - - - - -	68	169
Average number of pupils - - - - -	3,609	9,385
Cost charged to Imperial funds - - - - -	<i>Rs.</i> 37,969	<i>Rs.</i> 50,204
„ to other sources - - - - -	9,355	1,31,724
TOTAL - - - <i>Rs.</i>	47,324	1,81,928
Total annual cost of education per pupil - - - - -	13	19
Annual cost to Government per pupil - - - - -	10	5
STATISTICS RESPECTING FEES.		
Total amount of fees, fines, &c., realised from the pupils during the year - - - - -	11,934	31,821
Average ditto per pupil - - - - -	3½	3½

PUPILS.

	Hindoos.	Mahomedans.	Others.
Government Schools - - - - -	3,861	256	127
Private Schools - - - - -	8,224	426	2,472
TOTAL - - -	12,085	682	2,599

Bombay.

136. Of the 185 middle-class schools 165 are Government institutions, and 20 private institutions. All the middle-class schools in Bombay are Anglo-vernacular institutions. The Government schools are divided into two classes, viz., 1st. grade and 2nd. grade; there being 23 of the former, and 142 of the latter. The standard* laid down for entrance to higher class schools forms a standard up to which middle-class schools aim at teaching. The following general definition of a middle-class school is given in the Bombay report for 1865-66:—

* Vide Appendix G., page 188 of Bombay Education Report for 1865-66.

"The middle-class school is defined to be one in which, being inferior to the high school, some English is taught; its function used to be generally the preparation of boys for clerkships or other small appointments, but it has now the additional function of definite preparation for the high school, thus leading up to the University course."

137. The Bombay middle-class schools are stated by the director of public instruction to fall as yet short of their proper standard, and he has proposed, therefore, a re-organization of 19 of these schools on a standard which will make them "adequate feeders" to the high schools.

138. The following statistics relate to Bombay middle-class schools:—

	Government Schools.	Private Schools.
Number of Institutions - - - - -	165	20
Average number of pupils - - - - -	17,999	1,844
Cost charged to Imperial funds - - - - -	Rs. 1,03,346	Rs. 30,113
" to other sources - - - - -	1,36,274	98,191
TOTAL - - - - - Rs.	2,39,620	1,28,304
Total annual cost of education per pupil - - - - -	13	69
Annual cost to Government per pupil - - - - -	5½	16
STATISTICS RESPECTING FEES.		
Total amount of fees, fines, &c., realized from pupils during the year - - - - -	54,084	44,980
Average ditto, per pupil - - - - -	3	24

PUPILS.

	Hindoos.	Mahomedans.	Parsees.	Others.
Government Schools - - - - -	21,010	1,593	1,032	159
Private Schools - - - - -	197	41	1,332	706
TOTAL - - - - -	21,207	1,634	2,364	865

139. The average cost of education per head in the Government schools is somewhat high, but this is probably explainable both by the relatively high rates of pay obtaining in Bombay, and by an unusual amount of extraordinary expenditure in the way of constructing school buildings.

140. The comparatively large extent to which these schools are supported from sources other than Imperial funds is also noticeable. This is principally owing to large assignments to these schools from the proceeds of the "local rate of assessment," i. e., the education cess recently introduced in Bombay.

The assignments from this source to middle-class schools aggregated in 1865-66 as much as 1,10,875 rupees.

The following extract from the Bombay report of 1865-66 shows how this occurred:—

"The local cess has not only produced large additional funds for educational purposes, without any call upon the Imperial revenues, but has also stirred up a spirit of interest in education throughout the country, the local funds being placed at the disposal of talooka and zilla committees, subject to joint sanction from the Revenue Commissioner, and the Director of Public Instruction. These committees have been set to consider and make known the educational wants of their own talookas and districts. At first, there was a tendency in the local committees to seek the extension of English or middle-class schools, to the neglect of vernacular or lower-class schools. This course, if followed out, would have caused a misappropriation of the local funds, which, having been entirely subscribed by the cultivator class, should, in the first instance, have been applied to the establishment of vernacular or village schools, such as the children of the ryot would attend. A resolution of Government, No. 684, dated 14th of October 1865, (which is referred to above in paragraph 32, and quoted in Appendix D,

Appendix D., page 164), has authoritatively settled this point, and now no assignments of local funds to English education are sanctioned in this office, unless the collector of the district in question can furnish a certificate that the educational wants of the district, as regards primary schools, have been supplied as far as possible."

141. It may be noted further as a fact unexplained in the director's report, that the tables of receipts and charges, under the head of middle class schools, showed for 1865-66 a net excess of receipts over charges amounting to no less than rupees 48,864, being more than 20 per cent of the whole charges.

142. The figures given in the preceding statement, in respect of private middle class schools, show an exceptionally high rate of cost per pupil; but this is partly explained by the fact of some very heavy items of "extraordinary" charges for building, &c., (aggregating nearly half a lakh), being included among the disbursements. Making allowance for this, and for one or two expensive schools for European children included in the list, the cost per pupil is not so unreasonably high.

Oude.

143. Of the 46 middle class schools in Oude, 34 are Government institutions, and 12 private institutions. The Government institutions are all Tehsilee schools, of which 19 are Anglo-vernacular and 15 vernacular institutions. Of the private institutions three are mission schools, and the remaining nine are schools supported principally by the talookdars and native gentry.

The following statistics respecting middle class schools in Oude are given:—

	Government Schools.	Private Schools.
Number of Institutions - - - - -	34	12
Average number of Pupils - - - - -	2,099	677
	<i>Rs.</i> <i>a.</i>	<i>Rs.</i> <i>a.</i>
Cost charged to Imperial funds - - - - -	26,753 -	3,829 -
„ to other sources - - - - -	10,151 -	6,566 -
Total - - - - -	36,904 -	10,395 -
Total annual cost of education per pupil - - - - -	17½ -	15 -
Cost to Government per pupil - - - - -	12 -	5 -
STATISTICS RESPECTING FEES.		
Total amount of fees, fines, &c., realised from pupils during the year - - - - -	1,428 -	292 -
Average ditto per pupil - - - - -	- 11	- 7

PUPILS.

	Hindoos.	Mahomedans.	Others.
Government Schools - - - - -	2,032	956	1
Private Schools - - - - -	755	232	-
Total - - - - -	2,787	1,188	1

144. The extraordinarily high average cost of education per head is noticeable, also the smallness of the fee receipts, which average scarcely one anna per mensem in the Government schools, and little more than half anna per mensem in private schools.

Central Provinces.

145. Of the 116 middle class schools in the Central Provinces 105 are Government institutions, and 11 private institutions. Of the Government institutions, nine are zillah schools, which do not yet educate up to the university entrance standard, and 96 are town schools. Of the 11 private institutions, six are mission schools (of which four belong to the Free Church mission).

146. The following statistics respecting middle class schools in the central provinces are given :—

	Government Schools.	Private Schools.
Number of Institutions - - - - -	105	11
Average number of Pupils - - - - -	6,836	694
	<i>Rs. Ann.</i>	<i>Rs. Ann.</i>
Cost charged to Imperial funds - - - - -	50,080 -	9,541 -
„ to other sources - - - - -	39,433 -	10,438 -
Total - - -	89,513 -	19,979 -
Total annual cost of education per Pupil - - -	13 -	28 -
Cost to Government per pupil - - -	7½ -	13 -
STATISTICS RESPECTING FEES.		
Total amount of fees, fines, &c., realized from pupils during the year - - - - -	4,638 -	(not given)
Average ditto per pupil - - - - -	- 10	„

PUPILS.

	Hindoos.	Mahomedans.	Others.
Government Schools - - - - -	}	(not given.)	
Private Schools - - - - -			

147. The average fee is excessively small, viz., something below one anna per mensem. If the returns for Government zillah schools (which are only temporarily reckoned in the middle class till they can work up to the entrance standard), be separated from those of Government town schools, the result is, that the average fee in zillah schools is rupee 1½, or two annas per mensem, and in town schools not quite eight annas, or eight pie per mensem. The matter of fees evidently requires to be looked to in the central provinces.

Mysore.

148. Of the 16 middle class schools in Mysore nine are Government institutions, and seven are private institutions. Scarcely any information respecting these schools is given by the director of public instruction; and the statistics are so meagre that nothing more is obtainable than what has already been given in the general statement at the commencement of this section.

British Burmah.

149. There are three Government zillah schools coming under this head in British Burmah, with 398 pupils, the expenditure being rupees 13,612 from Imperial funds, and rupees 2,765 from local funds. There are also 28 private schools of this class aided by Government, with 2,077 pupils. These are almost all under the management of missionary bodies.

As noted in the last column of the general statistical statement given at the commencement of this section, the Education Report from British Burmah, written before the appointment of a director of public instruction, does not give the required statistics, and hence these schools have not been included in the general return.

Berars.

150. No educational statistics for the Berars have been entered in the general statement given at the commencement of this section, because no regular education report, with statistics in the prescribed form, has yet been received. The recently appointed director of public instruction for the Berars, will doubtless give full information in future years.

Meantime, it may be stated, that there are apparently five middle class schools in the Berars, two of which it is proposed to raise to the standard of higher class zillah schools.

SCHOOLS—LOWER CLASS.

151. The lower class of schools may be described generally as consisting of elementary institutions for educating the lower orders of the people. The subject of primary education is justly regarded as a most important one, and has had a prominent place assigned to it in the Educational Despatches of 1854 and 1859.

152. In the Despatch of 1854, the Home Government declared its wish for the prosecution of the object of vernacular education "in a more systematic manner," and "placed the subject on the level in a point of importance with that of the instruction to be afforded through the medium of the English language." An attempt will now be made to describe the measures taken in accordance with the above instructions in the several Presidencies and provinces.

Bengal.

153. In Bengal no fixed system was at first adopted, but various schemes were set on foot in different parts of the Lieutenant Governorship, with the object of promoting vernacular education. The measures in operation on the 1st of May 1858, were described in the following terms in a Minute by the Lieutenant Governor, dated the 24th March 1859:—

"Speaking of them generally, it may be said that 228 schools have been aided by grants in 27 districts, educating 16,633 pupils at an average cost to Government for each pupil of Rs. 1. 2. 1. per mensem for English schools, seven annas for Anglo-vernacular schools, and three annas eight pie for vernacular schools. Further, there have been 197 model vernacular schools established in 30 districts, at a total expense of Rs. 3,339. 14. 2. per mensem, or an average of about 17 rupees for each school.* There have been established 55 circles, embracing 158 indigenous schools established in four districts; and there have been 12 itinerent teachers employed in indigenous schools in six other districts. In six districts payments have been made to indigenous school teachers, for improvement in their pupils, at the rate of one rupee a month for every 10 boys under instruction, besides rewards for success given to such teachers in 11 other districts; and 10 scholarships have been provided, of four rupees each per annum, to meritorious vernacular pupils in 32 districts."

154. Referring to the above statement, the Government of India remarked, under date the 17th of May 1859, as follows:—

Para. 2.—"His Excellency in Council readily admits that it is shown in this Minute, that effective measures have not been wanting on the part of the Bengal Government for the encouragement of vernacular education among classes lower in the social scale than any which have been affected by the operations of Government previously to the receipt of the Court of Directors' Despatch of 1854; and he will have much pleasure in furthering the extension of those measures as soon as the means of doing so are again available. The Governor General in Council gladly expresses his concurrence in the opinion of the Lieutenant Governor that, for what has been done, credit is due to the officers of the Education Department in the lower provinces.

155. Very

* This low average is owing to the insertion in the list of all such schools, whether in Bengal, Behar, Cuttack, or Assam.

155. Very little, if any, advance in these directions has until recent years been made, owing principally to financial restrictions, and partly to a prolonged discussion which ensued between the Bengal Government and the Government of India, in which the latter argued that it was not the intention of the Home Government that the grant-in-aid system should be applied to the extension of this class of schools, but that any measures which might be taken should be based on the principle of having the schools under the direct management and control of the Government. The Bengal Government, having taken a different view, had contemplated a system of grants-in-aid to such schools, and had asked for a relaxation of the grant-in-aid rules in its favour.

156. The Bengal Government maintained that the cost of any system of vernacular instruction, by the direct instrumentality of Government, would make its general introduction impossible. It was argued that although cheap schools, costing, as in the North Western provinces, from five rupees to eight rupees per mensem each, had been to some extent found practicable in Behar and Assam, they were not practicable in Bengal proper. The great problem of a sufficiently cheap system of vernacular education, through the direct instrumentality of Government, remained the subject of discussion and report till 1860, when the Lieutenant Governor, writing with reference to previous correspondence, and especially to a recent call for a definite report of the measures desired to be introduced in connection with the Secretary of State's Despatch of 1859, propounded a system, the basis of which was the encouragement of the best of the indigenous schools by rewards to the masters, supply of books, &c.; a proportion of model schools being also established, and arrangements being made for maintaining an efficient inspection.

157. Sir John Peter Grant's scheme was very much modified in its actual application. It was transformed into a scheme, of which the following description was given in the report of 1862-63 :—

“The villages where patshalas are already in existence are invited to send, for a year's training in a normal school, either their present guru, or some other person whom they will undertake to receive as their future schoolmaster. Their nominee if accepted by the inspector, is sent to a normal school with a stipend of five rupees per mensem; and a written agreement is entered into on the one hand with the heads of the village that they will receive him back as their guru, when he has completed his course of training and received a certificate of qualification; and on the other hand, with the nominee himself, that he will return to the village which selected him, and there enter upon and discharge the duty of village schoolmaster, to the best of his ability, on condition of being secured a monthly income of not less than five rupees, in the shape of stipend or reward, so long as he continues to deserve it:

“Each of the three training-schools at present established receives 75 stipendiary students. They have been opened but a few months, but no difficulty has been experienced in filling them. Each has its full complement at the end of the year.”

158. There can be no question that this is by far the most promising scheme for encouraging primary education that has ever been tried in Bengal, and I shall, therefore endeavour to follow out its later history somewhat at length. At first its operation was confined to three selected districts (Burdwan, Kishnaghur, and Jessore), in each of which a normal school for gurus was established. In the first year of their working they had an average attendance of 217 gurus come from their respective villages to draw stipends of five rupees per mensem, and be trained as teachers. In the course of the year 171 students passed their final examination. In the second year of their existence (1864-65) they had an average attendance of 234 teachers—certificates being given to 203. In the third year (1865-66) only 75 certificates were issued; the cause of the decrease being the great prevalence of epidemic disease, which necessitated the closing of one training-school during several months of the year, and greatly interfered with the operations of the others. During the year sanction was obtained to the extension of the operations, under the same inspector, to three more districts, viz., Bancoorah, Midnapore, and Moorshedabad. Only one additional training-school was added on this account, four training-schools being considered sufficient for the six districts.

159. In addition to this, another inspector was appointed to superintend similar operations in North-east Bengal, in the districts of Rajshahi, Dinagepore, and Rungpore—three new training-schools being opened for the purpose.

160. So great is the number of applications for admission to the normal schools that, in the newly created institutions, it was found impossible to get several "free students," *i.e.*, students in excess of the authorised complement (75 per school), for whom there are no stipends, and who yet entered into the usual engagement to remain at the school, and to return to the nominating village as teachers when qualified.

161. It will be interesting to note the progress of this scheme in the three districts last taken up (Rajshahi, Dinagepore, and Rungpore), where Mahomedans constitute above two-thirds of the entire population; and where from the small number of existing patshalas, it is necessary to get the villagers to bind themselves, not merely to hand over an existing school to the teacher when qualified, but, if there be no school, to get one up. The number of Mahomedan nominees is already reported to be considerable.

162. It may be explained here that the scheme contemplates not merely the training of teachers, and the subsequent grant of five rupees towards the salary of each qualified teacher, but it provides also for the inspection of the village schools. For this purpose each of the two special inspectors has under him a staff of deputy inspectors. There were in 1865-66 altogether 19 deputy inspectors employed in this work.

163. The salary of five rupees paid to qualified teachers by Government is calculated to represent about half of their total income. That this is actually the case will be seen from the following statistics for 1865-66, given by the inspector in charge of the districts first selected :—

"The patshalas have, on the whole, gone on well during the year. They have increased in numbers and in attendance of pupils, and yielded no inconsiderable amount of income to their gurus in the shape of schooling-fees. Exclusive of the four training-schools, and as many model patshalas attached to them, I had under me, on the 30th April last, 521 village schools, with an attendance of 16,561 pupils, who paid 26,507-1 rupees in fees and otherwise to their gurus. The total cost to Government in these schools was 21,643-11 rupees, and therefore less than two annas per month per pupil. The scheme of patshala improvement, therefore, still fully maintains its character of being the cheapest to Government, and most easily expansible of all the systems of elementary education yet brought into operation."

164. The model patshalas above alluded to form another not unimportant feature of this scheme, for it is, of course, desirable that the embryo teacher should have some practical experience in the art of teaching before he leaves the normal school, and the means of this is afforded by the model or practising patshala attached to the central institution. In these model patshalas the native system is adhered to as much as possible, so as to secure their being really models of what it is intended that the village patshalas should be. The following account of the model patshalas is given by the inspector of the eastern circle :—

"In the constitution of the modern patshala, the native patshala system has been scrupulously preserved, but with such improvements as are desirable, which, while they promise success, avoid all unnecessary offence to established notions. The young lads attend school twice a day, and are arranged into the plaintain-leaf, the palm-leaf, and the paper classes. Zemindaree and Mahajanee accounts are largely taught. The schools open and close with the recitation of short songs in praise of our Maker, and on other appropriate subjects."

165. The following interesting account of the signing of the village contract is given by the same inspector :—

"It was past 11 A.M. when I reached Momilpore, a village in Rungpore. I was taken to where the head man of the place, a Mahomedan, with his relatives and servants, was preparing a mill for clearing the sugar-cane of its juice. At my approach he came up to me, saluted me respectfully, spread with his own hands several bundles of straw, on which one of his relatives hastily spread out a mat quickly snatched from a house close by. I took off my shoes and hat, and sat there. A large number of villagers assembled round me. They enquired, and I explained to them, the object of my visit. They heard me with attention, appeared pleased, but no less surprised; and, after some further inquiries, expressed themselves willing to set up a patshala. A nominee was after much difficulty fixed upon. They then desired me to wait till their brethren returned from the fields, as their consent and signatures were also necessary. On my telling them that I was willing to proceed to where their friends were, they seemed much pleased, and those who were not to accompany me were about to sign, when, considering that all this hasty consent might as quickly be withdrawn, I now

spoke in such a way that less willing men might easily have found some pretext for withholding their signatures, or, what is a polite way of evading, ask time to re-consider the matter. When I spoke in strong terms of the engagement to refund 60 rupees, in case they failed to establish the patshala, the younger brother of the head man, after some expressions about their sincerity, volunteered to make good the money himself, and gave the guru two slaps on the back to cheer him on. Finding them really in earnest, I again clearly explained myself; and having got the signatures of some, after the contract was read out once more by one of them, proceeded with the rest to where their comrades were reaping in the fields. We all walked together, and new accessions swelled the party, till in about 15 minutes we reached our destination. The men left their work and drew near. We sat down, and the head man undertook to explain the scheme. This is always very desirable. When he had done, I spoke. Their consent and signatures soon followed. Some of the elders could actually sign, while others made marks. I had previously come to know that there was a patshala in this village some 10 years ago. Having then talked with them of the threatened famine, and of the best way of manuring their fields, I left the place at past 1 P. M."

It is quite clear that the village contract is a useful feature of the scheme, for it secures for the future school the interest and patronage of the influential residents of the village.

166. I have already devoted more space in this note than can well be spared to the description of this most interesting scheme for encouraging the education of the lower orders of the Bengal people. There can be no doubt that it promises to be the best scheme that has been tried. It takes as its basis the national schools of the country, and it improves them at a cost sufficiently small to admit of a really wide extension of the system. The schemes attempted hitherto failed in one or other of two ways, viz., either—(1) by establishing Government or grant-in-aid model schools, which were filled by a class of the people far higher in the social scale than the labouring and agricultural population whom it was desired to influence; or (2) by attempting to encourage good teaching in village schools, the masters of which, however ready to take the offered rewards and to do their best to win them, were, from defective education, quite unable to carry out the desired reforms.

167. I do not mean to say that the new system affects only the labouring and agricultural population. In some parts of Bengal perhaps its principal effect is upon, what may be called, the middle classes of the people. This is shown by the following extract from the report of the inspector of the central, or first-instituted, circle:—

"I tried to point out in my last annual report, as well as on other occasions, that the patshalas are not and cannot be schools for the masses *exclusively*. I showed in that report that they are primarily preparatory schools for the children of the higher and middle ranks; and, at the same time being extremely cheap, are attended largely by children of the lower orders."

In the other, or eastern circle, it would seem that the scheme is more directly operative on the agricultural population, as may be gathered from the following extract from the inspector's report:—

"I have heard it talked of, even in high quarters, that the patshala system is not working among the masses. This, I think, is far from being the truth, though it is certainly to be owned that it does not influence the masses alone.

"Of the schools I visited in the Burdwan division (belonging to the other inspector) some had a sensible falling off in attendance during the growing and reaping seasons, when labourers cannot forego the assistance of their children. These children will, on all hands, be allowed to belong to the masses.

"My own division, however, is peculiarly the land of the masses. In Dinagepore and Rungpore, I do really feel that I am working among the lower classes. There the bulk of the people are agriculturists, while the higher orders are almost unknown.

* * * * *

The diaries of deputy inspectors teem with names of villages composed entirely of agriculturists."

168. It would be wrong if I were to pass from the description of this scheme without mentioning the names of the inspectors,* to whose able and zealous supervision the successful working of the system is doubtless due in no small degree.

* Baboo Bhoodeb Mookerjee, central division.
Baboo Kasseo Kanth Mookerjee, east division.

169. A somewhat similar system was tried with less success in Assam, where it was attempted to improve the village schools by training the teachers at a normal

normal school at Gowhatty. Recently two new normal schools have been opened at Tezapore and Seesaugor; and the subsidy allowances formerly given to the teachers in proportion to the number of pupils on their rolls have been re-distributed at fixed rates of five rupees and six rupees each for 114 schools. Better results are looked for.

170. The other systems of primary education in Bengal were thus described in the report of 1863-64 :—

“ The lower class of Government schools consists of the practising Patshalas attached to the Normal schools for training Village Gurus (to be mentioned below), and of some very cheap and elementary schools in Behar, which are at present far from being in a satisfactory condition. These latter have, for the most part, been working with untrained and unteachable masters, and little improvement is to be expected till this incubus is removed, and the present useless teachers are succeeded by men of a different stamp who have been properly instructed in the duties of their calling. An account of these schools will be found in Mr. Fallon's Report printed in Appendix A.

“ The private schools of the lower class, in which the standard of instruction is such as is suitable for the education of the ‘ masses’, comprise some ‘ circle’ mission schools receiving allowances under the grant in aid rules; a large number of schools in the central and south east divisions, established under what is called the ‘ circle system’; the Village Patshalas, under the charge of the additional inspector in Zillahs Burdwan, Nuddea, and Jessore; the indigenous schools, under improvement, in Behar and elsewhere, by a system of rewards; the subsidized village schools in Assam; and many missionary schools maintained with the aid of Government for the education of the Southals, Cossyahs, Kacharis, and other uncivilized tribes. For details regarding these schools, a reference must be made to the reports of the several inspectors, which are annexed in Appendix A.”

171. Of these, perhaps the circle system is the most important. It is thus described in the Bengal Report of 1863-64 :—

“ Former reports have described at length the system of circle schools originally brought into operation by Mr. Woodrow. The primary object of the scheme was the improvement of the indigenous village schools by giving rewards to the Gurus and their pupils, and providing each ‘ circle,’ which generally consisted of three schools, with a ‘ circle teacher,’ whose duty was to give instruction in each school for two days a week in rotation. The plan, with such modifications as circumstances have suggested, is working with considerable success in the central and south east divisions; but, as observed above, the schools are not mainly attended by the lower orders which are supposed to constitute the masses, and many of them have come to be good vernacular schools of the middle class, competing successfully in the vernacular scholarship examination. These schools, however, cannot generally be regarded as in any sense the representatives of pre-existing indigenous schools, since very few such schools were found in the districts in which the scheme has been introduced.

“ The actual plan of operations is thus described by Mr. Martin:—“ A good locality for a circle is fixed upon. If there is a *bonâ fide* Guru there, he is persuaded to admit the circle pundit; and then by his and other assistance two or more schools are established in neighbouring villages at the expense of the villagers, and placed under the care of young and intelligent men (chosen by the deputy inspector), who have received some education, and are capable of improving themselves with the assistance of the circle pundit. If there are no schools, the villagers are promised a pundit if they open schools attended by 120 pupils, and taught by men nominated by the deputy inspector, and as a suitable locality is fixed upon in the first instance (one too in which there is no chance of an aided school) there is generally little, if any, difficulty. When there has been a Guru of the old school, it generally occurs that within a short time he finds the work tedious and competition hopeless, and betakes himself to some other occupation, leaving the field to be worked by a set of young men taught in our own institutions.”

“ In 1855 a grant of 1,500 rupees per mensem was sanctioned for working the circle system, and this was subsequently divided in equal portions between the Central and south east divisions. Last year Mr. Martin, having reported that he should have no difficulty in doubling the number of his circles within a very short time if the necessary funds were placed at his disposal, sanction was obtained for the establishment of 30 additional circles in his division, at a cost of 750 rupees a month. The entire grant for circle schools amounts, therefore, at the present time, to 27,000 rupees per annum; of which, 18,000 rupees is assigned to the south-east division, and 9,000 rupees to the central division.”

172. In 1864-65 an attempt was commenced to improve the sanscrit toles in some parts of East Bengal. The Sanscrit toles are quite distinct from the Patshalas, being schools in which the philosophy and religion of the Hindoos are taught through the medium of the Sanscrit language. The Tole Gurus

exercise a considerable influence over the people, so that any improvement in the instruction which they give is an object of importance. The following account of the experiment is taken from the report of 1864-65 :—

“ A grant of 350 rupees has been sanctioned for one year for the introduction of an experimental measure in East Bengal for the improvement of indigenous Sanscrit toles, by systematizing the instruction conveyed in them and improving its quality. A scheme of studies has been prepared, and scholarships and prizes have been offered to the tole students who pass an examination in the prescribed subjects with credit. Rewards are also promised to the pundits of those toles which send up successful candidates. Under this scheme 11 toles have sent up 39 candidates for examination. The result was not known at the end of the year.”

From the Inspector's Report for 1865-66 the system appears to be at a standstill, owing to “ a hostile social movement” raised against it.

North Western Provinces.

173. The 8,258 lower class schools in the North Western Provinces are made up as follows :—

	Number of Schools.	Pupils.
Government Institutions :		
Hulkabundee Schools - - - - -	3,097	95,535
Private Institutions :		
Aided Schools - - - - -	48	2,827
Indigenous Schools, unaided - - - - -	5,118	56,893
TOTAL - - -	8,258	1,55,255

174. The “Hulkabundee” or “circuit” schools were introduced first some 15 or 16 years ago. The villages were portioned off into circuits, in each of which a school was established under the direct management of Government. The salaries of the teachers varied from 36 rupees to 60 rupees per annum; and the expense was met by a local contribution or cess nominally voluntary. The cess is calculated in different ways in different districts. The collector either determines the number of schools on the area and population of the district, and distributing the cost of maintenance over the revenue deducts an equivalent per centage; or he may consider one per cent. on the revenue a fair cess, and adapt his expenditure and number of schools to the amount which this per centage realizes; or he may take into account the wants and capabilities of the several circuits and deal separately with each. In all this he is presumed to have the consent of the people who are so assessed. It has recently been attempted to put the system of local assessment on a more secure footing. The late Lieutenant Governor, Mr. Colvin, recommended, and the court of directors sanctioned, the imposition of a one per cent. school cess in all new settlements, to be so calculated as to fall half on the proprietor and half on Government. The rules promulgated for guidance in this respect are included in what are known as the “Seharunpore settlement rules.”

175. In his report for 1858-59 the director of public instruction wrote :—

“ The circuit school system, wherever it has been introduced, has revolutionized popular education. It has trebled or quadrupled the attendance at school. It has introduced useful and instructive studies, and an efficient organization in place of an utter absence of books without any system. It has improved the status of the teacher, has rendered him independent of individual caprice, and has placed the school on a more permanent footing.’ In the report for 1860-61 it is further observed that the system ‘is gradually spreading, and will before long cover the land.’ The present condition of the Hulkabundee schools is thus described in the report for 1860-61 :—

“ The schools are very unequal in merit. Those in the first, second and third circles are, in many instances, superior to many of the Tehsilee schools in those divisions, while

while a large proportion of them are better than the Tehsilee schools in the Saugor and Nerbudda territories. The average attendance per school, which for the whole North Western Provinces is 21·6, ranges from 4·7 in Seonee to 42·8 in Etawah."

The following remarks, taken from the report of 1861-62, may also be added :—

Para. 1.—"The results to be considered in this section go to prove that the system of popular vernacular education, which has been on trial for 12 or 13 years in these Provinces, and has been regarded with interest, or taken as a model by other Governments, is extending its usefulness year by year. Its stability and aptitude for internal development and improvement is no longer doubtful, but the need of a vigilant system of inspection, and particularly of local encouragement, to aid the work of the departmental officers, is strongly marked, and is a feature peculiar to the country. The prosperous establishment of the Etawah district schools is a proof of what may be accomplished by local encouragement; but the state of those schools, as reported on by the late inspector of the second circle in December 1861, shows the absolute necessity of an organized departmental supervision.

2.—"The extension of the Hulkabundee School system over every district in the North-Western Provinces is a matter of time. When that is accomplished, a very considerable proportion of the school-going class will be brought under our direct teaching. At present strange contrasts exist; for instance, in the rich district of Bareilly, to the north, there is not a single Hulkabundee school; in the poor district of Jhansi to the south there are 77 schools, with 2,202 boys, and a fund available for building purposes of 20,000 rupees. In many of the districts of the Doab, the schools have been long established, and are increasing month by month. In Furruckabad, one of the wealthiest, they are just beginning to exist. In some of the famine-stricken regions the Hulkabundee schools maintained their vigour, whereas in more favoured places at the same period they apparently fell away."

176. In some instances, and especially at certain periods of the year, it is difficult also to keep up the attendance. The following remarks made by Mr. Griffith, Inspector, 3rd Circle, in the Report of 1860-61, will illustrate this :—

"The bulk of the Hulkabundee scholars are agriculturists; their time is most precious to their parents, and when the mangoes are ripe, or the crops are being stocked, on no account they can be spared: nay, each family has some cattle, and each family must send a child to look after them, and the more so since pounds have been introduced in these Provinces. The agriculturist boys are temporary visitors, and they flock to our schools periodically; and, as the average is struck for the whole year, it must be a low one for the Hulkabundee Schools, if they are reported truly, till people value education more than food and necessities of life."

177. In 1863-64 the Hulkabundee system was extended to the districts of Jaloun, Humeerpore, and Cawnpore. The school cess (which provides funds for these schools) was also successfully introduced throughout the 3rd or Benares Circle, notwithstanding that it comprises four permanently settled districts. In all these districts the landholders have voluntarily consented to pay the education rate, a fact which may justly be regarded with great satisfaction.

178. There are still districts, or portions of districts, without Hulkabundee schools; and the educational officers all look forward to the extension of the cess by the progress of the re-settlement operations. The following remarks made by the Inspector of the 1st Circle (embodied in the Education Report of 1865-66) give an encouraging proof of the growing appreciation of these schools :—

"There can be no doubt that these schools have now taken deep root. The difficulty no longer is to persuade the zemindars to allow a school to be opened in their village, but to select, as localities for the number of schools that can be afforded, villages the residents of which manifest the greatest desire for instruction, and where the greatest amount of good is likely to be effected. No inconsiderable portion of the inspector's time while on tour is now occupied in listening to the petitions of zemindars for new schools, or for the restoration of schools which for some reason have been withdrawn."

179. The 43 aided lower class schools in the North-Western Provinces are composed for the most part of Mission Schools, or schools supported by native gentlemen.

180. The 5,118 indigenous schools entered in the Returns were described generally in the Report of 1863-64 in the following terms:—

“Schools of the lower order, which have generally received the designation of indigenous, are the Persian, Arabic, and Sanscrit bazar schools, which are visited from time to time by the deputy inspectors of the department. An accurate calculation of the attendance and expenditure on these schools is next to impossible. The teachers keep no registers, and the salaries paid are irregular. As a rule, the average attendance seldom exceeds nine boys; and, as a better style of education creeps into fashion, attendance at these schools will fall lower. The character of the teaching has often been described. The hope of reform is very small, for the teachers are set against it, and desire no assistance from Government which shall involve the trouble of improvement.

“Indigenous schools are gradually giving way before the steady advance of the Government system of education. I observe that in the 1st Circle alone 142 schools have been closed during the year. As might be expected, the largest number of existing schools are to be found in the Bareilly and Bijnour Districts, where the Hulkabundee system has not been introduced. In Bareilly there are 557 schools, with 4,804 scholars; in Bijnour there are 373 schools, with 3,558 scholars. Again, take the two best districts of the Circle, and the result is that in Boolundshuhur alone 43 schools have closed this year, and in Meerut 33.”

Since 1863-64 about 600 more of these indigenous schools have been closed, yielding apparently to the advance of the Hulkabundee system.

Punjab.

181. The 1,771 lower class schools in the Punjab consist of 1,746 village schools (supported by the proceeds of the Education Cess, and corresponding to the “Hulkabundee” schools of the North-Western Provinces), 22 gaol schools and three indigenous schools, aided under the grant-in-aid rules.

182. There has been no advance in late years in the number of village schools in the Punjab; indeed the number in 1865-56 is 61 less than in 1863-64; but the number of pupils has increased from 51,753, to 56,593.

183. The gaol schools (numbering 22) were first placed under the Education Department in 1862-63. One or two trained teachers, aided by pupil teachers selected from the prisoners, conduct the classes. The pupil teachers are excused from labour, and occupy themselves partly in teaching and partly in learning, with the view of better qualifying themselves as teachers.

Madras.

184. The lower class of schools in Madras is represented by one Government School at Striharicottah for the Yenadis, a wild tribe inhabiting a jungly island to the north of Madras; 16 Government Schools for the Hill Tribes in Ganjam, and 825 private aided schools. These private aided schools are composed of the following, viz.:—

- (1).—“Rate Schools” supported by an Education rate, levied under the Madras Education Act. Of this kind there are 79.
- 2).—Schools managed by Missionary bodies. The majority of these are managed by the Gospel Society (in various districts, but principally in Tinnevely), and by the Church Mission Society (also for the most part in Tinnevely).
- (3).—The indigenous aided schools inspected by Government officers.

185. The development of education, under the Madras Education Act, has certainly not been great. The following remarks are made on the subject in review by the Madras Government of the Education Report:—

“The establishment of schools, under the provisions of the Madras Education Act, has not made much progress during the year under review. According to the Returns appended to the last Report, the number of schools supported by a rate at the close of the official year 1864-65 was 75, including 72 schools of this class in the Godavery District. At the end of 1865-66 that number had only risen to 79. Of the four new rate schools, one is in South Canara, and three in Malabar; the first mentioned being the Talook School of Mulki, which, at the request of the inhabitants, has been converted from a Government School into a rate school. The working of the Act in the Godavery District has not been satisfactory. The Inspector states that the machinery of the Act is ‘ill-adapted to the purpose to which it has been applied in the Godavery District,’

District, viz., the maintenance of elementary schools in villages the population of which is chiefly agricultural. The Commissioners, Mr. Bowers observes, 'are ignorant ryots, who care nothing for the school, and neglect their duties.' 'The only way,' he writes, 'in which they can be prevented from causing the abolition of the schools by simple inaction is to place them, in their capacity of School Commissioners, as they are in their capacity of Village Kurnums, under the authority of the Sub-Collector; but in that case the Act becomes a dead letter and a superfluity. This would be virtually a return to the ante-Act state of things, and would be an admission that these schools could never have been voluntarily maintained. Up to a very recent date, many of the masters had received no salaries for months.' From the Returns appended to the Director's Report, it appears that, in two of the talooks in which these schools are in operation, the amount of the collections under the Act was somewhat less than the Government grant.

"The difficulty of obtaining competent School Commissioners for the management of the rate schools is also adverted to by the Deputy Inspector of Schools in Malabar and Canara, in which districts, however, the Act appears likely to work well. In the latter district five middle-class schools have been established, and the preliminary measures for the establishment of five more, under the provisions of the Act, had been carried out before the close of the year. One of the latter, an Anglo-Vernacular School at Palghat, has been opened since the close of the year, with an attendance of 400 pupils. The Deputy Inspector reports that for this school a building, capable of accommodating 500 boys, is to be provided, at an estimated cost of 16,000 rupees, and the school is to be eventually placed under a graduate of an English University. He adds, that the introduction of the Act would succeed as well in Canara as in Malabar, were trained teachers available. In Coimbatore the inhabitants of 54 villages had placed themselves under the Act, and in 24 of them Commissioners had been appointed; but in none had any schools been opened before the close of the year. In only two had the Commissioners commenced to levy taxes, and even in these they had not ventured to employ any coercive processes, but had collected only from those who paid, if not willingly, at least without legal pressure. From what is stated by the inspector, it is to be feared that, in this district, the applications for the introduction of the Act can hardly have been voluntary in the true sense of the term. The matter is one which should be at once looked into."

186. In the schools managed by Missionaries no material extension of operations has of late taken place. About 245 of the lower class schools appear to belong to this head.

187. The indigenous schools under inspection number 498. They received grants aggregating 3,777 rupees on the "payment by results" system. The system is considered to have worked well, and its extension to indigenous schools in every district has been directed by the Madras Government.

Bombay.

188. Of the 1,177 lower class schools in Bombay, 1,108 are Government Institutions and 69 private institutions. In Mr. Howard's Memorandum of June 1865, the following account is given of the recent history of primary education in Bombay, and the difficulties which were encountered in the attempt to improve it.

Para. 47.—"No less pains were spent on the great question of popular education. It was long disputed in the time of the Board of Education, whether instruction for natives should be chiefly Vernacular or chiefly English. The Vernacular party in the main prevailed; and while English was little cared for, except at the Presidency town, Vernacular schools were opened in large numbers in the Mofussil at the sole expense of the State.

48.—"Afterwards, in 1854, a partially self-supporting system was established. Henceforth no new school was to be opened unless it was provided with a house, and more than half maintained by the people. It was hoped that existing schools would, by popular contributions, be gradually put on the same footing. The Educational Department inherited the partially self-supporting system from the Board; and under it more than 200 Vernacular schools were opened in the course of two years. A zealous educational officer could without much difficulty induce village communities to consent to establish a school, and to enter into the necessary agreement for its partial maintenance, but it was not foreseen that the agreement might not be observed and could not possibly be enforced. Further expansion in this direction was checked in November 1856 by the Supreme Government, who disapproved of the partially self-supporting system. Financial difficulties, caused by the mutiny, soon followed. All increase of educational expenditure was absolutely forbidden; and the work for the Educational Department then was to retrench, and, if possible, not to go back. The two years that followed were employed in organising the existing schools. Stricter discipline was introduced. The school fee was levied from all but 20 per cent. of poor

scholars, cheap and improved school books and maps were produced. Each boy was compelled to buy the text book of his class. Registers were more carefully inspected, and nominal attendants were struck off the roll. It was a time of hard work, and the village schools were reduced to order. But their number could not be increased; and the apparent, though perhaps not the real, attendance was diminished. A new impulse was given in 1859 by an order of the Secretary of State, permitting, what before was forbidden, the re-distribution of school expenditure. The Statistical Returns at once began to improve, and from that day progress has been uninterrupted. The number of the Vernacular schools has, since 1854-55, risen from 240 to 925, the attendance from 18,888 to 61,629.

49. "This development is due, as before has been set forth, not to the increase of the Imperial grant, but to the voluntary contributions of the people. It was not, however, supposed that the ultimate wants of the country under the head of National Education, could thus be provided for. How to meet those growing wants was earnestly debated. The partially self-supporting system was gradually dropped by common consent. In place of the popular subscription so lightly promised, so reluctantly paid, an enhanced fee was levied amid general satisfaction. Mr. Coke deserves the credit of this change.

50. "Every suggestion for extending the area of popular education was discussed. The project of working through the existing indigenous schools was carefully considered, and unanimously, or almost unanimously, rejected. The grant-in-aid system was clearly inadequate, and was pronounced by the Secretary of State to be so. It was necessary to look to the direct action of the Government. Proposals were made to levy an educational tax, and whether this should be compulsory or voluntary was warmly disputed. I took the voluntary side, on political grounds, and drafted an Act analogous to the Municipal Act (XI. of 1853) to enable communities to tax themselves for common schools. I also recommended the immediate levy, where it was legal, of the extra land assessment, which had been reserved for education, and the collection of all other local funds (as 'chilhur' and the like) which might be made applicable to the same purpose. I also sketched a plan for constituting each talooka an educational district, with one principal and affiliated humbler schools. This is known as the 'talooka system,' and has been kept in view in all recent developments of Vernacular education.

51. "At length in 1864 the Bombay Government were pleased to levy the extra land assessment, and declared a proportion of it to belong to education in the district where it was levied. Local funds of other kinds were also collected, and Zillah Committees, in which both the revenue authorities and the director of public instruction were represented, were appointed to control the expenditure of the local income on schools and other objects. This system is new, and has hardly had time to bear fruit."

189. The local cess above referred to yielded in 1864-65 2,15,359 rupees, and in 1865-66 3,19,524 rupees. The agriculturist ratepayers, however, do not seem to get the full benefit of it. I have already noticed the fact (paragraph 167 above) that no less than 1,10,875 rupees of the proceeds of the "local rate of assessment" were accredited in 1865-66 under the head of "Middle Class Schools." 11,930 rupees were credited under the head of "Higher Class Schools," and 14,469 rupees under the head of Institutions for special or professional education principally on account of Normal schools. The above items aggregate 1,37,274 rupees, deducting which from the total receipts, 3,13,524 rupees, there would be left 1,76,250 rupees available for lower class schools; but, in point of fact, only 49,301 rupees are credited under the head of "Lower Class Schools."

Good use, however, appears to have been made of this sum, as may be inferred from the following extract from the Director's Report of 1865-66:—

Primary, or vernacular schools.

Para. 52. "The operation of the local cess has given us an increase of 229 in the number of these schools, and of 23,041 in the number of scholars, during the year. In Guzerat I was impressed with the vitality of primary education, and was pleased to find that boys belonging to the cultivator class were beginning to attend the Vernacular schools in considerable numbers. But I am not yet in a position to pronounce, from personal knowledge, on the primary education of the Presidency. Two points in the subject are clear:—First, that in order to form a judgment, we require more definite standards of examination; secondly, that in order to improve the teaching of the native masters, we require an enlargement and improvement of our training establishments."

Oude.

190. The lower class of schools is represented in Oude by 61 Government Hulkabundee Schools, and 36 private schools. The private schools are all aided under the ordinary Grant-in-aid Rules.

191. The Hulkabundee schools are all situated in the Oonao district, the recent re-settlement of which provided the means of establishing village schools on the system first adopted in the North-Western Provinces. These schools were only started in 1865-66; and the results are very encouraging. As the settlement operations advance, the system will be extended to all districts in Oude.

192. The village school teachers are all trained for their work in the Lucknow Normal Schools, to which they go for a year for the purpose, getting stipends of four rupees each while under training.

Central Provinces.

193. The lower class of schools in the Central Provinces, consists* of 546 village or Hulkabundee schools, supported by the education cess, and 680 private schools. The latter number is made up of 661 indigenous schools, and 19 zemindaree schools, maintained by feudatories and zemindars on their estates. The school cess in the Central Provinces was doubled in 1864-65, and the extra funds thus made available were found very useful in increasing the salaries, and thus securing a better class of teachers. The number of vernacular languages existing almost side by side in the Central Provinces, renders it particularly difficult to get good teachers on small salaries. The additional funds were also partly expended in the erection of suitable school houses.

194. The indigenous schools are thus described in the Education Report :

“ These schools may be divided into three classes—

“ 1st. Those receiving a regular monthly grant from Government.

“ 2nd. Those receiving grants under the payment by result rules.

“ 3rd. Those receiving casual gifts, in money or books, for the masters or pupils.

“ Of the 1st class there are only five; the grants have all been made recently, and with the object of establishing schools in localities where none previously existed, and where it was not desirable to establish a Government School, or where a Government School could not be established at so low a cost. Schools of this kind should, after having been established two full years, be aided not by a regular monthly grant, but according to the rules for payment by results. In the 1st class there are five schools receiving monthly grants aggregating 45 rupees.

“ Of the 2nd class, during the past year, 25 schools† have presented pupils for examination, and a total of Rs. 408. 1., has been paid, the largest amount paid to one school was Rs. 47. 4. Of 273 pupils examined, about 20 per cent. failed. The only districts in which teachers have come forward to claim rewards are Saugor, Nimar, Narsingpore, and Nagpore. I do not feel satisfied that proper attention has been paid to this very important branch of our educational system, and district inspectors have not yet thoroughly explained the rules to the teachers. A number of schoolmasters in the Jubbulpore district, who received grants last year, refused to receive them this year; and one of the most intelligent of the class informed the inspector the reason was that the parents of the children objected strongly to his taking any aid from Government; they seemed to dread it as the insertion of the thin end of some mysterious wedge. When the rules for regulating these payments by results were drafted, I thought them sufficiently liberal; but a revision will be necessary, as they are not so liberal as the rules in other parts of India, which have for many years enjoyed greater educational advantages than the Central Provinces. I shall submit shortly a revised code of rules.

“ The schools of the 3rd class now number 656, with 12,267 pupils. The most remarkable development of these has taken place in the district of Sumbulpore, and particularly in the Burghur Tehsilee. At the close of 1864-65, there were 42 indigenous schools in Sumbulpore, with 647 pupils; there are now 114 schools, with 4,340 pupils, and during the same period, schools of every description and scholars have very largely increased. The people also have subscribed liberally; besides what they pay directly to the teachers, and which it is impossible to state with any degree of accuracy, they have subscribed for the building of school houses, and for the maintenance of the schools, a sum of 3,350 rupees. When it is remembered that only four years ago this district was not free from rebels; that at that time, what the Central Provinces were to the other Provinces of India, so was Sumbulpore, the Bœtia of the Central Provinces, I think it will be admitted that the good work inaugurated by

Captain

* There are also a number of police and gaol schools, of which mention is made in the Report, but they are not directly under the Education Department, and are not therefore included in the statistical returns.

† These have not been included in the statistical returns.

Captain Cumberlege is not the least important, or the least interesting page of this year's history of British India. The hearty manner in which the people have seconded the district officer's exertions for the education of their children is a proof that old animosities have passed away; and in their enlightenment we have some security for their continued loyalty. I append extracts from the memorandum of education by Captain Cumberlege and his district inspector for the last quarter of 1865-66, detail more fully than I can do in this report their operations during the past year. They will well repay perusal, and their publication would be useful to the officers of their districts."

Mysore.

195. The lower class of schools is represented in Mysore by 32 Government Vernacular Schools, and by 15 Grant-in-aid schools of a similar class. The private schools are designed almost exclusively for Mussulmans, and are reported to be wanting in order and system. Improvement, however, is expected, as they are stated to have been recently better supplied with books, and regularly visited by the deputy inspector.

British Burmah.

196. The statistics for British Burmah, have not, as already explained, been included in the general statement; but it may be hoped that the recent appointment of a director of public instruction will ensure the receipt of full information with the prescribed statistical statements in future years.

197. There are about 259 lower class aided village schools in British Burmah, superintended by missionary bodies, with about 3,691 pupils.

198. It is expected, however, that it will be soon possible to make progress in the direction of encouraging the existing indigenous schools of the Province. The following account of these institutions was given in 1864 by the Chief Commissioner:

"The existing native schools of Burmah are the Buddhist monasteries. The monks are supported by the daily alms of the people. The fabrics are generally built by private individuals as works of religious merit. The monasteries have no endowments. The monks, who inhabit them, perform the priestly offices required by the laity, and educate children. For these services they are supported by voluntary gifts and daily alms. There is scarcely a village in the whole country without one of these institutions. For the great mass of the pupils, it may be said that the education imparted does not go beyond instruction in reading and writing the vernacular language, that is, Burmese, and the rudiments of arithmetic. For those who intend to enter the priesthood, of course a higher degree of instruction is necessary, which need not here be described. As a general rule, it may be stated that all instruction among the Burmese people is carried on in the monasteries. There are a few private schools here and there, but they are exceptional. There is no other regular plan or system of schools which could be taken in hand and improved. I would not recommend that Government should set up schools in the villages as additional, or in opposition to the monasteries; such a scheme would inevitably be a failure."

199. As regards the proposed plan of improving these schools, the Chief Commissioner expressed the following opinion:

Para. 15. "To carry out this plan, I am of opinion that we should do nothing more than induce the monks in the several monasteries to accept certain books for the instruction of the pupils. We may already have some excellent school books in the Burmese language.

They are as follows:—

- "1. Geography, by the Reverend G. H. Hough (maps wanting).
- "2. Treatise on Land Measuring and Triangulation.
- "3. Stilson's Arithmetic; an admirable work.
- "4. 'The House I Live in;' translation of an interesting little work on human anatomy.
- "5. Sketch of Ancient History, by the Reverend E. A. Stevens, American Baptist Missionary.
- "6. Legendre's Geometry.

"If there were only a work on elementary astronomy, we really have every book required to commence the work now proposed.

"The task of inducing the Buddhist monks generally to accept of and teach these works in their monasteries, of course in addition to the existing ecclesiastical or theological course of education, would require very great tact, judgment, and discretion.

Some

Some Buddhist monks, to whom I have spoken on the subject, have not been averse to the plan. The work would have to be superintended by a man of superior attainments, one well acquainted with the Burmese language and the character of the people."

200. In pursuance of the above suggestion, steps were taken for the appointment of a Director of Public Instruction. The appointment did not actually take place till August 1866. The following account of the success already met with was given by the Chief Commissioner in February last:—

"It will be seen that, notwithstanding some opposition, there has been so far very encouraging success. In the towns of Rangoon and Moulmein the Buddhist monks of 45 monasteries, having 115 pupils, have allowed the books on arithmetic and land-measuring, and in some instances geography, and a small book on anatomy, to be taught. The monks themselves will not teach these books, partly from a feeling of pride which will not allow them to teach foreign books, and partly from an ecclesiastical prejudice peculiar to Buddhist ascetics, that the only true knowledge is contained in the Beedagat, and that worldly knowledge is waste of time. Still they allow the books to be taught."

Berars.

201. There are apparently 29 Mahratta village schools in the Berars. It has been proposed to increase this number by the addition at once of 72 new schools. No detailed information is available respecting these schools; but, now that a regular Education Department has been organised in the Berars, it may be hoped that full information will be available in future years.

FEMALE SCHOOLS.

Bengal.

202. In Bengal, there are three Government Schools for the education of Native girls, with 153 pupils, and 217 private schools, with 5,559 pupils.

203. The Director of Public Instruction has made no remarks whatever in his Report for 1865-66 on the important subject of Female Education. This is a great omission; for, though some of the appended reports of the inspectors contain information on the subject, it would have been only proper to give prominence to the matter by a few remarks from the Director himself.

204. Mr. Woodrow, the Inspector of the Central Division, evidently takes a great interest in the subject. He opens his remarks on the subject with the following paragraph:—

"*Female Education.*—The most interesting feature in the educational operations of the year is the extension of female education. Not only is there an increase of the numbers under instruction, but owing to the beneficial action of the Ootparra Desh Hitoyseni Shova, there is a prospect of general improvement in the quality of the instruction imparted. I last year reported that 'the total number of girls attending schools in the Central Division, exclusive of the Bethune and several private schools, was 999 in April 1863, and 1,530 in 1864.' In 1865, the number had risen to 1,963. In April 1866 it amounted to 2,823. Counting in the Bethune School and the girls in six missionary schools in the Nuddea Zillah, the number is 3,307. Female education being yet in its infancy, it is interesting to the public to know how these numbers are made up, and in what parts of the country the advance is most perceptible."

Mr. Woodrow then goes on to give a detailed list of girls' schools, showing the following results:—

		Pupils.
Aided by Government :		—
Schools	- - - - -	1,877
Circle Patshalas	- - - - -	90
Zenana Associations	- - - - -	610
Unaided :		
Under Missionary Bodies	- - - - -	442
Under Native Managers	- - - - -	103
Girls attending Schools for Boys	- - - - -	60
Government Female School (Bethune School, Calcutta)	- - - - -	125
TOTAL		3,307

He adds the following remarks :—

“There are now 58 grant-in-aid schools, with 1,877 girls in them, against 36 schools, with 1,219 girls last year. The two Zenana Associations, with 278 ladies under instruction, have increased to four associations, with 610 ladies. The number is increasing monthly, and want of funds, rather than want of houses open to instruction, now places the limit on rapid extension. The girls attending circle schools have fallen off from 135 to 90, and those attending schools for boys, from 82 to 60; but those attending unaided girl schools have increased from 149 to 208. On the whole, the total shows an increase this year from 2,008 to 2,970, or of 962 girls. This success attending the efforts of the Ootterparra Association for promoting the good of the country deserves to be brought prominently to the notice of Government.”

205. In the South-East Division there is a Government training school for mistresses at Dacca, with 24 pupils on its rolls; and it is stated by the Inspector that “applications have been received for mistresses from Rajshahi, Rungpore, Calcutta, and Sherepore.” There are altogether in the South-East Division 64 girls’ schools (53 of which are aided by Government), with 917 pupils.

206. In the South-West Division there are 30 girls’ schools (26 of which are aided), with 1,010 pupils. In the North-West Division there do not appear to be any measures on foot for female education, and the returns do not include any girls’ schools.

207. In the North-East Division there are 25 girls’ schools (all aided), with 530 pupils.

North-Western Provinces.

208. In the North-Western Provinces there are 497 Government schools for girls, with 9,269 pupils, and 77 private schools, with 1,494 pupils.

209. About 100 of these schools were added in 1865-66. The Director of Public Instruction refers to female schools in his report for that year, in the following terms :—

“These schools are all of the most elementary description, the expenditure is limited, and the parents of the children are generally poor. They are a beginning by no means despicable, and are under careful inspection. Coming across, as I do, in the course of my tours, towns where formerly at the mention of girls’ schools, one’s Native advisers and coadjutors would shake their heads, but where now girls’ schools are in healthy operation, I cannot but look forward to more extended results, though it will be long before we overtake the ignorance of the population. The visits of experienced officers are not regarded with distrust. The natives soon grow familiar with an inspector who performs his work honestly and regularly, and place confidence in his advice. Younger and less experienced officers, who are naturally less able to make allowance for deficiencies, which even the most cursory inspection will disclose in schools, perhaps of only a few months’ standing, have in some instances caused discouragement by the tone of their remarks. Deception in the matter of attendance cannot at first be altogether avoided, and will gradually disappear before a patient examination into results such as that which has been conducted during the year of report.”

210. There are also two recently established normal schools for mistresses, one at Agra and another at Ourai, a village about 13 miles from Futtehpoore. Both these institutions are favourably noticed by the inspectors, and the Director makes the following remarks regarding them :—

“Small normal seminaries of this character are manageable; and, when the experiment has been fully tested, I shall ask the inspectors to consider the advisability of establishing one in each district, for the improvement of the girls’ schools in that district,—it being manifestly unadvisable, if not impossible, to institute one large normal school for the whole of the circle, as, in the case of schoolmasters, steadiness, rather than rapidity of progress, has hitherto been our aim, and results seem to prove the wholesomeness of the principle.”

Punjab.

211. The 1,029 female schools in the Punjab, with their 19,561 pupils, are composed of 333 Government schools and 696 private schools.

212. As the Punjab stands foremost of all other provinces in respect of the numerical results of female education, it may be well to give here some account of the rise and progress in that province of so recent but important a feature of educational operations.

213. The

213. The following paragraph extracted from the Punjab Education Report of 1862-63, refers to the period when the first real impulse was given to the movement in favour of female education in the Punjab :

"At the educational durbar * * * his honour, the Lieutenant Governor addressed the chiefs of Lahore and Umritsur, and called their special attention to the necessity for providing education for their daughters as they had already for their sons, and promised them assistance in carrying out any plan they might devise for that purpose. Accordingly committees were appointed at each of the two cities, and it was arranged that the family priests of certain of the best families, viz., 30 at Lahore and 40 at Umritsur, should undertake to teach, each of them at least, one female from his own or his client's families. While giving this instruction, the priests are to be paid at the rate of 10 rupees per mensem; and as soon as the pupils become proficient enough to impart knowledge themselves, they will be taken into the service of the families with which they are connected as governesses, and the pay of the priests will cease. The governesses will teach the females not only of their own or their patron's families, but also of respectable neighbours of a lower social grade. These again will probably be glad to open schools of their own, or to take service as schoolmistresses with Government or private persons. And so it is hoped that, beginning with the upper classes, the stream of female education will gradually permeate through the several strata of native society. For starting the scheme, which amounts to supplying the means of training within their home circles, at least 70 governesses, most of whom will be fit to act as teachers by the end of a year, the sum of 8,000 rupees is required for the year 1863-64, and special application has been made for it."

Training of governesses at Lahore and Umritsur.

214. In the following year (1863-64), the director of public instruction gave the following account of the result of the scheme referred to above :

"In paragraph 64 of my last Annual Report, I explained how a scheme had been proposed for training up governesses, and placing them in the families of the upper classes of native society at Lahore and Umritsur. This scheme was afterwards changed; for it was found that the adult females, who were taken under instruction in the first instance, had domestic cares and duties which sadly interfered with their speedy advancement in study, and young girls were found much sharper learners than adults. Again it was found that there was no real objection to the employment of male teachers; whatever objection there was, was directed against the innovation of teaching females at all. And when, through the example set and arguments used by a few leading members of the native community, these objections were gradually overcome, the system of private female instruction by family priests in the houses of the chiefs and notables, and of schools in every mohulla for the wives and daughters of the middle classes, soon became generally prevalent. As these schools are not open to inspection, I am dependent for my information regarding them on the reports of the committees of native gentlemen; but from these reports, and from the great interest shown in the matter throughout by his Honour the Lieutenant Governor, there can be no doubt about the subject of female education having been taken up far more earnestly than could have been expected in so short a time. Most of the schools are probably very elementary, and a good deal of the scholars' time is no doubt devoted to instruction in their own religious books; yet a fair amount of attention seems to be paid to secular studies as well, and some few girls have made good progress, judging from the specimens of handwriting produced as the result of their unassisted efforts. I also understand that the teaching of plain needle-work has been commenced, and proves decidedly popular. One thing is at any rate very certain that the formation of these schools to so large an extent at the two chief cities of the Punjab has brought the subject to the notice of all classes throughout the province, and has greatly facilitated the spread of female education in other districts.

"I may also mention here that, within the last two or three months, Baba Khem Singh, a lineal descendant of the Guru Baba Nanuk, and greatly revered by all classes of his countrymen, has been preaching at Jullunder and its neighbourhood in favour of female education. He has since then spontaneously proceeded as far as the Rawul Pindie District, bent on the goodly work of stirring up the people to educate their daughters. The success of his mission has been immense, and girls' schools are now starting into existence by scores and even hundreds, I believe, in those parts of the Punjab which he has visited."

215. The results for 1863-64 in respect of female schools were thus described in the same Report :

"There are now 204 Government female schools, instead of only 103 at the beginning of the year. The number of girls has increased from 2,224 to 3,993; of whom 3,414 are Mahomedans, and 579 Hindoos; 53 of the girls in the Jullunder District are learning English, 439 Persian, 3,312 Oordoo, and 561 Nagree. The average daily attendance has nearly doubled, being now 3,058.

"These schools are all under the direct control of district officers, many of whom have interested themselves greatly in the matter, and have set them on foot at

considerable personal trouble. The charges are borne exclusively by the one per cent. Educational Cess Fund. The great difficulty is to exercise proper supervision over them. Although it would be obviously preferable to employ female teachers, and the want of them is felt by some district officers to be a great impediment to the progress of female education, yet the people do not seem to object to male teachers for their daughters, so long as they are allowed to make their own selection. And, strange to say, the selection not unfrequently falls upon young men, as well as old, occasionally on a mere lad, one of the senior scholars in a neighbouring town or village school. The prejudice against inspection in many places continues very strong, though it has been completely removed in others by the district officers. All that is necessary at present seems to me to be to withhold any good rate of pay from the teacher where the school is not open to occasional visits from the Deputy Commissioner, or at any rate from some trustworthy Native officer selected by him, and approved of by the people who send their children to the school. Money and official favour are the two great motive pioneers in this matter."

* * * *

"Of private female schools there are seven ordinary aided schools, six of which are connected with missions, and one is a school for girls of European parentage at Anarkullee, Lahore. This last is of a superior kind, and so are the orphanages at Loodianah, Umritsur, and Kangra. But, besides all these, there are the very important, though as yet elementary, female schools in the cities of Lahore and Umritsur, numbering no less than 223, and containing 3,841 scholars. These schools are entirely under the management of committees of native gentlemen at the two chief cities of the Punjab. Eight thousand rupees were assigned for their support as a special grant by the supreme government; but the amount actually expended on them has been 11,520 rupees from Government, and 1,404 rupees from private subscriptions and donations of the chiefs and notables."

216. So far as the female schools under private management were concerned, the requisite funds were supplied from Imperial revenue as a charge under the head of grants-in-aid. In respect of the female schools under Government management, the funds were, in the first instance, made available from the Education Cess Fund. Towards the close of 1864 the female schools, under the direct management of Government, numbered 192, costing 1,633 rupees per mensem; and there were 55 more, costing 270 rupees per mensem, which had been started and kept up on promises held out to the teachers that Government would eventually grant them salaries. On a representation shortly after made by the Lieutenant Governor, the Government of India sanctioned an assignment of 10,000 rupees per annum for three years from Imperial revenue towards the support of these schools, leaving the cost of such schools as were situated in agricultural villages to be met from the Education Cess Funds. It was at the same time observed that any further extension of female schools should be carried out on the grant-in-aid principle, which, it was remarked, if readily accepted, would "afford some test and pledge that the spread of female education is real and truly desired by the people of the Punjab." While anxious to afford every encouragement to the spread of female education, the Government of India did not wish that educational or district officers should allow their zeal to betray them "into so exercising their influence with natives of the better classes as to amount in fact to a pressure which the natives do not feel able to resist."

217. The Report for 1865-66 shows an increase since 1863-64 on the Government Female Schools from 204 to 333, the number of pupils having likewise increased from 3,993 to 6,834. As regards private female institutions, the number of pupils had risen to 12,727, of whom 8,352 were Hindoos, 4,161 Mahomedans, and 214 Sikhs and others.

Madras.

218. Female education does not seem to have been as yet the subject of any special interest or exertion on the part of the educational authorities in Madras. There are no Government female schools; but the returns show 139 female schools under private management, with 3,315 pupils. Many of these are probably for children of European descent; no special notice is taken of them in the Madras report.

Bombay.

Bombay.

219. In Bombay the Government female schools were increased during 1865-66 from 23 to 33, and the number of pupils from 639 to 1,036. The returns for private female schools are mixed up with those for boys' schools, but there appear to be 32 institutions with upwards of 1,400 pupils.

220. The following remarks on the subject of female education are made by the director in his report for 1865-66 :—

“ I have recorded above (paragraph 26) an increase during the year of 10 female schools and 397 pupils. But when we compare the total number of female pupils on the rolls in Government schools, namely, 1,036, with the average daily attendance, namely, 695·3, the unsatisfactory character of most of these institutions must be at once inferred. The first characteristic of our girls' schools is extreme irregularity of attendance; the second is that they are in reality infant schools, in which it appears to me that the great bulk of the children, being very young, sit looking on, while a few girls at the top of the school receive a little instruction. In submitting this general observation, I must, however, refer to Mr. Curtis's Report, paragraph 25 (Appendix A 2, page 42), in which a favourable view is taken of the prospects of female education in Guzerat. Some of the private girls' schools (under inspection), and especially the Roychund Deepchund school at Surat, are exceptions to my general remark. Captain Waddington (Appendix A 1, page 23) reports favourably of the (private) Parsee girls' schools attached to Sir Jamsetjee Jeejeebhoy's Benevolent Institution. Female education, which is of course closely connected with different phases of social and religious feeling, is better received among some castes of the people than others, and as yet it shows more signs of flourishing among the Parsees of Bombay and the Banias of Guzerat than among the more literary Brahman communities of the Deccan or Concan. Looking at the question broadly, I am afraid it must be asserted that the public education (properly so called) of course is incompatible with the system of infant marriages, and with many existing prejudices of the people on the most delicate subjects, think that the education and civilization of such portion of the people of India, together with the example of the European community, will inevitably bring in the education of the women of India, but that this result will be very gradual, and will be subsequent to many important social changes. In the meanwhile, I am humbly of opinion that private and missionary exertion may do much to help on the cause, but that Government is precluded from taking any prominent steps to accelerate the movement.”

Oude.

221. There are no Government female schools in Oude, but there are 11 private schools, of which one is for European and Eurasian girls. The 10 schools for native girls are managed by missionary bodies, five of them being in connection with the Church of England and five under the American mission. Three of these schools were opened during 1865-66. The Director of Public Instruction writes respecting them as follows :—

“ The schools are visited regularly by the ladies of the two missions, who speak very favourably of the progress made by the pupils. Instruction is given in reading, writing, and arithmetic.”

The following remarks are taken from the same Report :—

“ I believe that the Reverend Mr. Reuther, at Fyzabad, has opened one or two girls' schools in that city. The head masters of some of the zillah and tehsil schools have also, during the past year, made attempts to interest those around them in female education; two or three small schools have been opened, but their success is not yet certain.”

Central Provinces.

222. The 92 female schools in the Central Provinces are all Government schools supported, like other village schools, from the education cess funds. The following account of them is given by the Director :—

“ These schools have increased during the year from 65, with 1,244 pupils, to 92, with 2,361. The largest number in any district is at Saugor, where there are 26 schools with 713 pupils; in the district of Chindwarrah and Upper Godavery none have yet been opened. The progress made in these schools must be slow; and, except in places where European ladies interest themselves, I do not anticipate great results.

The movement in favour of educating girls is interesting, and should be encouraged to a certain extent, to show that female education is one of the things Government aim at; but I believe that the most certain, and the most speedy, way of educating the women of India is to educate the men; when we have a generation of educated fathers, there will be little difficulty about the education of their daughters. It is well in the Central Provinces to have a few girls' schools in every district; but, as they are entirely supported by local educational funds in the same way as the boys' schools, I would not sacrifice the efficiency or the number of the latter, to greatly extend the means of education for girls, unless, indeed, by the offer of fees or subscriptions, the people manifested a real desire for such institution."

223. A Female Normal School was established at Nagpore during 1865-66. It has 20 women in it, and the management of the institution is reported to have been successfully conducted.

Mysore.

224. There are no Government female schools in Mysore; and of the seven female schools under private management, two are designed for European and Eurasian girls. The other four are for Hindoo girls, and are reported to be "all well attended, and making steady progress."

British Burmah.

225. There are seven female aided schools in British Burmah, with 409 pupils. The following account of these institutions is given by the Chief Commissioner in his Report of 1865:—

"There are five female schools in the Pegu division, and two in Tenasserim.

Karen Female
Institute, Tounghoo.

"The most prominent institution of this character is the Karen Female Institute at Tounghoo, under the superintendence of Mrs. Mason, for the instruction of the daughters of Karen mountaineers. This school has been in active operation during the year, and is supported entirely by the people. It numbers 66 pupils. On the 15th of January 1866, the annual examination was held in the institute. 'The scene was interesting,' says Mrs. Mason, 'as it was the first time that Karen Mountain Chieftains sat as judges, and awarded prizes to Karen young women for attainments in scholarships.' * * * * *

'There were present also strange new visitors in nine Manu-Manau chieftains from beyond the Eastern water-shed, and two Gaikoo chiefs from near the northern boundary. In all there were 41 chiefs and elders present from the mountains, with 50 students and jungle teachers.' The vernacular department of this school was taught eight months, the English department ten.

Burmese Girls'
School, Tounghoo.

"This indefatigable lady has also revived her school for Burmese women at Tounghoo. It was in operation during the last quarter of the year under review, and at its close contained 29 pupils.

St. John's,
Rangoon.

"The next school of note in the Pegu division is St. John's institution. It is both a girls' boarding and day school, in which those who can pay for board and education are required to pay; and it is also a free school and orphanage in which those who are too poor to pay, or who have no parents, friends, or relations to support them, are fed, clothed, and taught gratis. It is admirably conducted by a lady superioress and four sisters of charity, who impart elementary instruction to the pupils in both English and Burmese. In the English department there are 55 pupils; and, in the vernacular or free section, there are 60, 30 of whom are orphans, and the remainder day scholars. The way this school is conducted reflects the highest credit on all connected with its management. Major Laurie observes of these schools:—"I found everything to be in a most satisfactory condition, forming remarkable aids to the causes of education and philanthropy."

St. Joseph's, Moul-
mein.

"The female schools in the Tenasserim division are located at Moulmein. St. Joseph's institution, under the control of the Reverend Father Guerin, is conducted by a lady superioress, assisted by seven sisters of charity. The average attendance during the year has been 108; of these 39 were orphans, and 69 day scholars. The instruction is elementary, and embraces needlework. The orphans are educated free of charge, while the other pupils pay a fee varying from three to six rupees per mensem. The Commissioner who presided at the examination held on the 19th December last, reports that 'the older girls have made considerable advancement since the time of the examination of the previous year; the younger children were progressing satisfactorily.'

Girls' vernacular
school, Moulmein.

"Two Burmese women conduct a girls' school at Moulmein, under the superintendence of the Reverend Mr. Haswell. The average attendance in this school has been 50 girls, of the average age of 10 years; each pays a fee of one anna a month, and are taught reading, writing, and the simple rules of arithmetic."

Berars.

226. There do not appear to be any female schools in the Berars.

Concluding Remarks respecting the Classification of Pupils in Schools.

227. have already (paragraph 54) shown that, of the whole number of Hindoos and Mahomedans attending colleges, only $3\frac{1}{2}$ per cent. are Mahomedans. It will be seen from the following figures, relating to the pupils attending schools in the principal provinces of India, that the per-centage of Mahomedans is 18 per cent. :—

	Bengal.	North- Western Provinces.	Punjab.	Madras.	Bombay.	TOTAL.
Pupils attending Higher Class Schools :						
Hindoos - - - - -	16,828	2,360	9,377	5,063	1,337	34,965
Mahomedans - - - - -	1,561	375	3,362	473	28	5,799
Pupils attending Middle Class Schools :						
Hindoos - - - - -	40,896	13,783	5,784	12,085	21,207	93,755
Mahomedans - - - - -	4,241	3,380	2,238	682	1,634	12,175
Pupils attending Lower Class Schools :						
Hindoos - - - - -	32,374	121,713	29,125	14,049	63,653	2,60,914
Mahomedans - - - - -	5,040	32,903	24,816	87	4,947	67,793
TOTAL - - -	{Hindoos - - - - -				3,89,634	
	{Mahomedans - - - - -				85,767	
GRAND TOTAL - - -				4,75,401		

228. The proportion of Mahomedans is greatest in lower class schools, where it reaches 20 per cent., which is probably not far from the actual proportion borne by the Mahomedans to the Hindoo population of the country generally.

SECTION VI.

INSTITUTIONS FOR SPECIAL EDUCATION.

229. THE following statement contains statistics respecting institutions for special education :—

INSTITUTIONS FOR SPECIAL EDUCATION, 1865-66.

	Bengal.		North-Western Provinces.		Punjab.		Madras.		Bombay.		Oude.		Central Provinces.		Mysore.		British Burma and the Berars.	
	Government.	Private.	Government.	Private.	Government.	Private.	Government.	Private.	Government.	Private.	Government.	Private.	Government.	Private.	Government.	Private.	Government.	Private.
NUMBER OF INSTITUTIONS.																		
Normal - - - - -	24	3	8	3	7	3	7	4	6	-	2	-	6	-	1	-	Owing to the pointment of loss of Public instruction, and organisation, a separate Department of Education in Burmah and Berars having recently been tried out, there is no sufficient facilities available. a general reference to the Institution in British Burma coming under head will be in the body of note.	
Others - - - - -	13	1	2	-	-	-	7	-	5	3	-	-	-	-	1	-		
Total - - - - -	37	4	10	3	7	3	14	4	11	3	2	-	6	-	2	-		
NUMBER OF PUPILS ATTENDING THEM.																		
Normal - - - - -	1,280	71	455	62	294	80	1,011	207	258	-	392	-	153	-	27	-		
Others - - - - -	920	246	254	-	-	-	473	-	280	180	-	-	-	-	32	-		
Total - - - - -	2,200	317	709	62	294	80	1,484	207	538	180	392	-	153	-	59	-		
EXPENDITURE.																		
Normal:	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		
From Imperial funds -	87,996	3,750	38,077	3,700	15,287	2,100	49,331	4,913	28,776	-	4,460	-	3,162	-	5,626	-		
„ Other sources - -	4,035	11,536	7,626	5,196	16,140	2,155	4,659	16,975	15,955	-	13,700	-	7,720	-	-	-		
Others :																		
From Imperial funds -	2,07,010	1,000	86,203	-	-	-	1,02,969	-	64,220	10,505	-	-	-	-	4,493	-		
„ Other sources - -	33,948	5,417	-	-	-	-	6,488	-	13,250	15,413	-	-	-	-	-	-		
Total :																		
From Imperial Funds -	2,95,006	4,750	1,24,280	3,700	15,287	2,100	1,52,300	4,913	92,996	10,505	4,460	-	3,162	-	10,119	-		
„ Other sources - -	37,978	16,953	7,626	5,196	16,140	2,155	11,147	16,975	29,205	15,413	13,700	-	7,720	-	-	-		
GRAND TOTAL - - -	3,32,984	21,703	1,31,906	8,896	31,427	4,255	1,63,447	21,888	1,22,201	25,918	18,220	-	10,882	-	10,119	-		

230. I now proceed to make a very few remarks respecting the special institutions in each province.

Bengal.

231. Of the 24 Government normal institutions in Bengal, four are English departments, and 20 vernacular.

The four English departments have proved a failure, as will be seen from the following extract from the Director's Report for 1865-66 :—

“English Departments: Calcutta, Hooghly, Dacca, and Patna.—The English departments opened a year ago in the normal schools at Calcutta, Hooghly, Dacca, and Patna, as announced in last year's Report, have hitherto failed in the object for which they were established. Students with the proper qualifications cannot be induced to enter them, because they are not affiliated to the University, so that attendance at them is no qualification for admission to the first examination in arts, whilst the Syndicate declines to accord the privileges of schoolmasters to the pupil-teachers who join them. Unless some concession is made on this point, there seems little probability of obtaining any adequate results from these departments, and it will be advisable to abolish them.”

The 20 vernacular training institutions were more successful. Twelve of them are intended to train masters for vernacular middle-class schools, seven are

are specially designed for training gurus for indigenous schools, under the scheme already described under the head of Lower Class Schools, and one at Dacca is for female teachers.

232. The following extract from the Director's Report for 1865-66 will show how a large proportion of these useful institutions have been set on foot during the year under review :

"New Vernacular Normal Schools Opened.—Three normal schools were opened at the beginning of the year in East Bengal, at Mymensing, Comillah, and Coomarkhali, for the training of masters for middle class vernacular schools; and four similar schools commenced operations in Behar, located respectively at Bhaugulpore, Purneah, Gya, and Chuprah.

"In North-East Bengal three new normal schools for the training of gurus for village patshalas have been opened under a new inspector, Baboo Kassi Kanth Mookerjee, at Rajshai, Dinagepore, and Rungpore, each providing for 75 stipendiary pupils; and another similar school has been started by Baboo Bhoodeb Mookerjee, at Midnapore, in South-West Bengal.

"In Assam, the normal school at Gowhatti, which had not been successful, has been re-organised at a reduced expense, and additional normal schools have been sanctioned for Tezapore and Sebsaugor, in order to make better provision for the supply of masters for the elementary vernacular schools of the Province.

"From these statements it will be seen that an important advance has been made during the year in the means of raising a supply of teachers qualified for conducting the middle and lower class schools throughout the country."

Of the three private normal institutions, one (in Calcutta) is for mistresses.

233. Of the 14 other institutions for special education, two are schools for training in useful arts—one a Government institution, and the other a private institution—both situated in Calcutta. Two are the Mahomedan madrissas at Calcutta and Hooghly, respecting which remarks will be made under the head of Oriental Institutions (Section VII.); six are law classes attached to the colleges in Calcutta and the Mofussil; one is the civil engineering department of the Presidency College; and three are the English, Bengalee, and Hindoostanee classes of the Calcutta Medical College.

234. I find that it would lead almost beyond the reasonable limits of a note like this to enter into any detailed description of these institutions, and I have not, therefore, attempted it.

North-Western Provinces.

235. Of the eight Government normal schools in the North-Western Provinces, six are for male teachers, and two for female teachers. The latter have already been noticed under the head of Female Schools, and the former are institutions designed to train teachers for the vernacular schools in the Province; there being one for each of the three large circles at Agra, Meerut, and Benares, one in Almorah for the Hill circle, and special normal classes at the schools of Ajmere and Etawah.

236. The three private normal institutions appear to be intended for the training of other than native teachers.

237. Of the two other special institutions, one is the Civil Engineering College at Roorkee, and the other the Agra Medical School designed for giving an education to native doctors.

Punjab.

238. The seven Government normal schools in the Punjab are designed for training vernacular teachers for the town schools and village schools. In 1865-66 they turned out 44 town school teachers, and 133 village school teachers. Out of 2,012 teachers employed in Government vernacular schools in the Punjab, 1,417 have already undergone a normal school training. There are 166 now under instruction, leaving 429 who have yet to be sent to a training institution.

239. The three private normal schools are all for training female vernacular

244. K 3 teachers.

teachers. One of them is in connection with the S. G. P. Mission at Delhi, and two are under native committees at Lahore and Umritsur.

240. The number of women under instruction during the year was 80, of whom 40 were Hindoos and 40 Mahomedans.

241. The Lahore Medical College has not been entered in the Punjab Returns. It is an institution started, some seven years ago, with the object of training native doctors and also sub-assistant surgeons. The school department (for native doctors) has turned out already some 51 men qualified as native doctors, and six men have been qualified as sub assistant surgeons in the college department.

Madras.

242. The seven Government normal institutions consist of five schools and two normal classes. They are not merely vernacular training schools, but qualify teachers also for Anglo-vernacular schools; six of these institutions sent up successful candidates for the university entrance examination, the aggregate number being 21, of whom 12 came from the Madras normal school.

243. The following notice of these institutions and of the private normal schools was taken by the Government of Madras on reviewing the Education Report of 1865-66:—

“The Report on the Government normal school at Madras is again unfavourable. The Director of Public Instruction states that the arrangements have been defective, and the management faulty; that, in the general examination for certificates, the students showed to disadvantage when tested in method and teaching power, and proved, in many instances, in these subjects, to be inferior to the untrained candidates. The Governor in Council has now under consideration a detailed Report which the director has recently furnished, with the view of enabling the Government to determine what steps it will be necessary to take with the view of restoring this important institution to the condition of efficiency which it maintained under the management of its first principal. Orders will be passed on the subject at an early date.

“The normal schools at Vizagapatam, Trichinopoly, Vellore, and Cannanore are all doing fairly. That at Trichinopoly is in a very satisfaction condition. Owing to the difficulty which is experienced in inducing Canarese candidates for training to resort to the normal school at Cannanore, which is situated in the district of Malabar, it is proposed to form a normal class in connection with the provincial school which is about to be established at Mangalore, in the district of Canara. The Reports on the training institutions supported by the Church Missionary Society at Palamcottah, by the Society for the Propagation of the Gospel in Foreign Parts at Sawyerpuram and at Tanjore, and by the Christian Vernacular Education Society at Madura, are all, more or less, favourable.”

244. The seven other special institutions in Madras consist of—

The Medical College	- -	{ College Branch. Collegiate School.
The Civil Engineering College	-	{ College Branch. Collegiate School.
Law Department of the Presidency College.		
School of Industrial Arts, Madras.		
School of Ordnance Artificers, Madras.		

Bombay.

245. The six normal schools in Bombay are all Government institutions. They are intended primarily for supplying qualified teachers for vernacular schools. The two principal institutions are at Poona and Ahmedabad. In his Annual Report of 1862-63, Mr. Howard warmly advocated the experiment of turning the training institutions at these two places into vernacular colleges, arguing as his reason that the purely normal school training produced men deficient in general education. The experiment was tried, but has failed, as appears from the following extract from the Report of Sir A. Grant (the present Director of Public Instruction) for 1865-66:—

“As a point of general interest, I beg humbly to refer to my letter to Government (Appendix G., page 185) on the Poona ‘Vernacular College,’ as it used to be called, in which

which the experiment was made (but without success) of combining the teaching of higher subjects through the medium of the Marathi language, with the ordinary functions of a normal school. Government, concurring in the views expressed, were pleased to sanction the limiting the functions of this institution (under the name of the 'Poona Training College') to the preparation of schoolmasters. Subsequently I have made analogous proposals with regard to the 'Ahmedabad Vernacular College,' in which a similar experiment appeared to have failed equally. I am humbly of opinion that it is an anachronism to attempt vernacular colleges for Western learning at the present day. Such colleges will only be possible when large numbers, and perhaps several generations, of scholars have been habituated to think and express themselves on scientific subjects in the vernacular languages. The training of native schoolmasters in normal schools and training colleges is such an important matter, that we cannot afford to allow any diversion of the energies of those to whom the task is intrusted. The institutions of this kind at Poona and Ahmedabad are working fairly. Those recently established at Belgaum and Hyderabad have made a good beginning."

246. The eight other special institutions in Bombay consist of the following:—

Government Institutions	-	1.—Grant Medical College, Bombay.
		2.—Law School, Bombay.
		3.—Poona Engineering College.
		4.—Engineering School, Hyderabad.
		5.—Guzerat Provincial College, Ahmedabad.
Private Institutions	-	6.—David Sassoon Industrial and Reformatory Institution.
		7.—Furdoonjee Sorabjee Parak's School of Arts and Industry.
		8.—Sir Jamsetjee Jeejeebhoy School of Arts.

The Guzerat Provincial College is an institution connected with the Ahmedabad high school, the special subjects of education being law, logic, moral philosophy, history, mathematics, and Sanscrit.

Oude.

247. That two special institutions in Oude are Government normal schools, located at Lucknow and Fyzabad, and intended to train teachers for the Tehsilee and village schools. The Fyzabad institution is a temporary branch of the Lucknow school. The levy of the education cess is being rapidly extended over Oude, and its extension will be followed by an equally rapid establishment of village schools. For these schools it is necessary to provide masters; and hence students aspiring to the office of village teachers are being collected and trained at the two schools mentioned above. The period of training is one year. At the close of the year the two institutions contained 392 pupils, of whom 378 were under training as teachers for village schools, and the rest (14) for Tehsil and other schools.

Central Provinces.

248. The six special institutions in the Central Provinces are all Government training institutions. Of these, one (at Nagpore) is a superior institution designed for training masters not only for town and village schools, but for zillah schools. Four of the institutions (at Jubbulpore, Hoshungabad, Raepore, and Khundwah) are intended for training teachers for vernacular town and village schools; the school at Khundwah being merely a normal class for the Nimar district, opened in the last month of 1865-66.

249. The remaining institution is the Nagpore female normal school. It was commenced in September 1865, and is reported to have made steady progress. Twenty female pupils are studying in it.

Mysore.

250. Of the two special institutions in Mysore, one is a Government normal school intended to train teachers for Anglo-vernacular schools. There are 27 students under training.

The other institution is an engineering school, which had 32 pupils at the close of the year.

British Burmah.

251. There are two special institutions in British Burmah, both under private management. One of them is the vernacular "Karen Theological Seminary" at Rangcon, designed to fit young men for the Christian ministry; and the other the "Normal and Industrial School" at Bassein, which contains two departments, the one an Anglo-vernacular school, and the other a vernacular training school; the industrial element pervading both.

252. Besides the above, a large number of the aided middle class schools in British Burmah partake, more or less, of the character of normal institutions.

SECTION VII.

ORIENTAL CLASSICAL LANGUAGES and ORIENTAL INSTITUTIONS.

253. I introduce this subject no so much with the idea of giving any valuable information regarding it, as with the object of bringing an important matter into prominent notice. It has only been at the last moment, while preparing my note for the press, that the idea occurred of making a separate section for this subject, and the information afforded, as well as the remarks offered, are not so complete as could be wished.

254. It has already been noticed, under the head of "Universities," that the vernaculars had recently been excluded from the Calcutta list of languages, which may be taken up for the first examination in arts. The list now is as follows:—

Greek.	Sanscrit.
Latin.	Arabic;
Hebrew.	

and one of these must be taken up by every candidate at the first arts examination.

255. In the Bombay University a similar alteration was made, the list adopted being the same as that given above for the Calcutta examination.

The Madras list still contains the vernaculars as optional subjects, both in the first arts and B.A. examinations; and it is not till the M.A. examination that a candidate is bound down to one of the classical languages.

256. The effect of the alteration made in Calcutta and Bombay has been to make it necessary for every college student to study a classical language; and, of course, the Oriental classical languages, Sanscrit and Arabic, are generally preferred. Of these two Sanscrit seems to be decidedly the favourite, and the Government colleges have now, for the most part, been provided with separate Sanscrit teachers or professors.

257. An interesting point to be noticed in this section is the history of the various institutions which were originally designed for the special cultivation of Oriental studies.

258. In the Despatch of 1854, the Home Government remarked as follows (paragraph 8):—

Para. 8.—"The systems of science and philosophy, which form the learning of the East,

East, abound with grave errors, and Eastern literature is at best very deficient as regards all modern discovery and improvements. Asiatic learning, therefore, however widely diffused, would but little advance our object. We do not wish to diminish the opportunities which are now afforded in special institutions for the study of Sanscrit, Arabic, and Persian literature, or for the cultivation of those languages which may be called the classical languages of India. An acquaintance with the works contained in them is valuable for historical and antiquarian purposes, and a knowledge of the languages themselves is required in the study of Hindoo and Mahomedan law, and is also of great importance for the critical cultivation and improvement of the vernacular languages of India."

259. In the case of almost all Oriental institutions attempts have been made to combine a good general education with the special or Oriental studies. In some instances success seems to have followed the attempt; in others the Oriental element seems to have been entirely or practically extinguished.

260. The Bengal Oriental institutions are the Sanscrit College in Calcutta, the College of Mahomed Moshim at Hooghly, and the Mahomedan Madrissa in Calcutta. The old Hindoo College no longer exists, as it has been merged in the Presidency College.

261. In the matter of reform, the Sanscrit College presented the easiest field of operations, for it was supported entirely by Government without any specific assignment of funds, and consequently without any obligation, actual or implied, for the maintenance of a particular organisation. The college was founded in 1824, and at first Sanscrit was studied exclusively, with restrictions as to the caste of the pupils allowed to enter it. When the old Hindoo College was broken up, its sister institution, the Sanscrit College, was allowed to stand. The Government of Bengal, in its letter to the Council of Education of the 21st October 1853, intimated as a sort of solace to the Native managers of the former institution, that "the Sanscrit College shall be maintained by the Government exactly as it is." In March 1859, however, the Director of Public Instruction (Mr. Young) pointed out to the Bengal Government the following defects in the condition of the institution, viz. :—

"1st.—It has not been brought within the influence of the University, and, under its present constitution, it is not likely to be able to send up any candidates to the University for degrees.

"2nd.—It occupies an isolated position as regards other institutions; there is no interchange of advantages, no emulation of teachers or pupils between it and other schools or colleges.

"3rd.—Its examinations, awards of scholarships, &c., are all managed within itself; and so managed as to excite little interest and command little confidence among the outside public.

"4th.—It is still that 'compound of a college and a dame's school,' which the other colleges were a few years ago, but are no longer.

"5th.—It devotes to the teaching of obsolete science and philosophy much time which would be better given to subjects of more practical utility."

262. The re-organisation which followed the above representation left the Sanscrit College on precisely the same footing as any ordinary Government college, with its attached collegiate school, with the following exceptions, viz. :—

(1).—Sanskrit is taught in all the classes both of the school and college. Sanscrit in fact occupies in the school department the same position as Greek does in a public school in England, the standard in Sanscrit being much higher than the ordinary pass standard in the University, just as the standard in Greek in the sixth form at Eton is much higher than is required for a pass degree at Oxford or Cambridge. Before passing their University entrance examination, the school boys read in Sanscrit far beyond the B.A. requirements; and they continue their higher Sanscrit studies between the entrance and first arts examination, so that they are in a position to pass the M.A. Sanscrit examination one year after passing the B.A.

(2).—There are special encouragements to the study of Sanscrit in the way of Sanscrit scholarships. The fee rate in both school and college classes is not high (three rupees per mensem), and in the school department the sons of *bonâ fide* pundits, to the number of 100, are admitted on payment of a reduced fee of one rupee.

263. A full description of the changes introduced in the Sanscrit College will be found in the report of the institution contained in the Appendix of the Bengal

Education Report for 1863-64, and in a letter from the Principal to the Government of Bengal, No. 44, dated the 8th April 1864. The institution is reported to have been brought "into complete harmony with the University course." In 1865-66 there were 266 students in the school department, and 20 in the college department.

Hooley College
and Calcutta Ma-
drissa.

264. The Hooghly College is the next on the list; and as its history and that of the Calcutta Madrissa are in most respects similar, I shall treat of them together. The Hooghly College was founded in 1836, and is mainly supported from funds bequeathed by Mahomed Moshim, a wealthy Mahomedan gentleman, who, dying without heirs in the year 1806, left his large property, yielding an annual income of 45,000 rupees, to Mahomedan trustees "for the service of God." Owing to the misappropriation of the funds, Government assumed the office of trusteeship. The right of assumption was opposed by the original trustees, but upheld both by the Courts in India and by the Privy Council in England. The period of litigation extended over many years, during which the annual income accumulated, forming a surplus fund of 8,61,100 rupees. This fund was devoted to founding and endowing the Hooghly College. It was further increased by a portion of the original Zemindaree and by the lapse of various pensions with which the estate had been burdened.

265. The Calcutta Madrissa, as stated in a Minute by the Lieutenant-Governor of Bengal, dated the 15th September 1858, was founded by Governor-General Hastings in 1781, in order to give to Mahomedan students "a considerable degree of erudition in the Persian and Arabic languages, and in the complicated system of laws founded on the tenets of their religion," so as to enable them "to discharge with credit the functions and duties of the criminal courts of judicature, and many of the most important branches of the police, which it had (in 1781) been deemed expedient to continue in the hands of Mahomedan officers." In a recent letter addressed by the principal of the Calcutta Madrissa to the Director of Public Instruction (No. 592, dated 22nd October 1864), it has been claimed, on behalf of the institution, that the Government is merely in the position of a trustee for the endowment, and that it is just as much bound to administer those funds for the special objects originally contemplated, as in the case of the sister institution at Hooghly. Major Lees's arguments on this point are given in the note* at foot.

266. Up

* 40. "The Madrissa was founded in 1780 by the then Governor General Warren Hastings. Though old for a Government Educational Institution, it is not yet so old that one would expect to find its origin lost in antiquity. Yet such would here really appear to be the case. The Education department seem to look upon it as purely a Government institution. The Mahomedans, on the other hand, have always maintained that it belongs to them, being a bequest made to their community by Warren Hastings from his private property; and they have often spoken of the Madrissa Mahal, or board lands of college, of the which no one now appears to know the whereabouts. Within the last few days, however, I have read the record of the institution, as compiled by Mr. Fisher in the Appendix to the Parliamentary Report in 1832, and it would appear that both these suppositions are equally erroneous. The institution, it is true, was originally founded by Warren Hastings, and maintained by him at his own cost for a short time; but finding it beyond his means to do all that he desired, he subsequently recommended that he should be paid back all he had expended; and that the institution should be endowed by a grant of certain villages, and 'that the lands appropriated for the maintenance of the Madrissa be delivered over to the charge of the said superior or guardian, and the jumma of them separated from the public revenues.' This recommendation was confirmed by the Board, or then Council of India. Certain lands and villages were assigned for the support of the institution in the 24-Pergunnahs, and a *Sunnud* made out for them in the name of the preceptor or principal. These lands were called the 'Madrissa Mahal.' A claim, however, was afterwards set up to them by the Rajah of Nuddea, which was considered good; and it would appear that, for some time, the preceptor held them under the Rajah. The revenues, however, fell off, and, in 1819, a question arose as to the liability of Government, the committee of the Madrissa claiming, on behalf of the institution, the full amount of the rental of the lands when granted, or (29,000) twenty-nine thousand rupees per annum. 'To that amount (or even 30,000 rupees),' said the committee, 'Mr. Shore considered the Government chargeable for the expenses of the Madrissa, whether,' as he expresses himself, 'the farmer (of the benefice lands) made good his payment or not.' The orders of the Governor General on this claim were as follows: that 'the expenses of the institution having fallen below the funds appropriated for its support,' consequently, on a strict balancing of account between the institution and Government, a considerable sum would be found due to the institution. His Lordship does not, however, think it necessary to go into a minute examination of these details, but is pleased to resolve that the revenue of the Madrissa shall, for the future, be taken 30,000 sicca rupees per annum (= 31,875 company's rupees).

41. "It would seem from the foregoing that, if the Mahomedans are wrong in one respect, they are right in the main point, viz., the endowment of the institution, and, no doubt, had the lands remained attached to the college till this date, its revenue now would be double (30,000) thirty thousand rupees per annum, as has been the case with many of the royally endowed schools of England. The Mahomedan view of the case was confirmed by the orders of the Court of Directors of 1841, and confirmed again by the Despatch of the Secretary of State, of 28th February 1861, in which those orders were republished. Of this endowment, then, the Mahomedans cannot with justice be deprived, and the institution, therefore, costs the Government little or nothing; it has been in the enjoyment of this endowment now for nearly a century; the Mahomedans are proud of the institution; they send their children to it from many distant parts of Bengal, and it has conferred on them very great benefits."

266. Up to 1820, the Calcutta Madrissa was under the uncontrolled management of Mahomedan professors, and, as a consequence, the studies had become nominal, and its ample annual resources had been "dissipated* among the superior and subordinate drones of the establishment." The institution was then (1820) placed under English superintendence, but the system of tuition remained much the same, being described so late as 1850 by Dr. Sprenger, the principal, in the following terms:—

* Lushington's
Report of 1821.

"The system is, in fact, precisely the same as the one which was in vogue in Europe during the darkest ages, and it produces the same results. The sophistries of dialectics learned in a sacred language puff up the professors with conceit, render them hostile to everything practical or founded on experience, and extinguish in them the sense of art and beauty, and blunt the sentiment of equity and morality."

267. The history of the Hooghly Madrissa, up to 1850, had been of much the same character, and hence it was that, in the educational reforms which took place between that year and 1854, both of these Mahomedan institutions were re-modelled. In both of them a junior or Anglo-Persian department was created, the senior or Arabic department being made quite distinct and separate. In the latter department a more modern and rational system of instruction in the Arabic language, and in the principles of Mahomedan law, was substituted for the antiquated and faulty system of the Indian moulvies, and the teaching of false physical science was altogether prohibited.

268. In both cases the Anglo-Persian or general departments have flourished, while the special or Arabic departments have languished.

269. In the Hooghly institution the Anglo-Persian department was merged into a collegiate institution, with school and college departments, like other Mofussil colleges. The institution was affiliated in 1857. The Anglo-Persian department of the Calcutta institution has only recently been affiliated to the University, and that only as educating up to the first arts standard. It is noticeable, however, that the Hooghly college and collegiate school appear to have been completely monopolised by Hindoos, to the almost entire exclusion of Mahomedans. The distribution of pupils, for 1865-66, was as follows:

	Pupils in 1865-66.			
	Hindoos.	Mahomedans.	Others.	TOTAL.
Hooghly College - - - - -	133	6	2	141
Hooghly Collegiate School - - - - -	236	43	8	286

Considering that these departments were supported, in the year under notice, to the extent of 45,407 rupees, from the "proceeds of endowment," it may be a question whether the funds bequeathed by a Mahomedan, however usefully employed, are being expended in a manner consistent with the special object for which they are held in trust. It is true that, while the fee rates are Rs. 2. 8 and three rupees in the school, and four rupees and five rupees in the college, Mahomedans are admitted, both in the school and in the college, at the reduced rate of one rupee; but the results seem to show that, even with this privilege, the arrangements are not such as to maintain the original character of the institution as one designed specially for the education of Mahomedans. In the Anglo-Persian department of the Calcutta Madrissa, all the students (238) are Mahomedans, none but such being eligible for admission. The fee rate is one rupee.

270. I have already said, that the special or Arabic departments have languished. The following account of them is extracted from the Bengal Education Report of 1863-64:—

"There are two Government Madrissas, or Arabic Colleges—the Calcutta Madrissa, to which is attached an Anglo-Persian school; and the Hooghly Madrissa, which, as already stated, is a department of the College of Mahomed Moshim. The course of instruction

instruction in both is exclusively Arabic, and Mahomedans alone are admitted. The students are required to possess some knowledge of the elements of Arabic before admission, but no other test of education is required; and few of them have learnt more than is ordinarily acquired from the private teaching of Mahomedan moulvies. The course of instruction extends over five years, and comprises grammar, literature, rhetoric, logic, and law. Mahomedan law, and, as a necessary consequence, Mahomedan theology, constitutes in reality the staple study of the classes; and the two institutions may be regarded as purely professional seminaries engaged in the training of moulvies, moollahs, casis, and the like, for the supply of the social and religious needs which the creed of Islam imposes on its votaries. In the Calcutta Madrissa there are 12 senior scholarships, four of 20 rupees a month, and eight of 15 rupees, available for the 1st and 2nd classes; and 16 senior scholarships, of eight rupees a month, for the 3rd and 4th classes. For the corresponding classes in the Hooghley Madrissa, there are 14 senior scholarships, two of 50 rupees, four of 20 rupees, and eight of 15 rupees; and 16 junior scholarships of eight rupees. These institutions are not affiliated to the University, their course of study having no affinity with that prescribed by the University regulations; but, as a special case, the rules for the award of the (English) junior scholarships have recently been so far relaxed as to allow the junior scholars from the Anglo-Persian department of the Calcutta Madrissa to hold their scholarships in the Arabic department, provision being made for the simultaneous prosecution of their Arabic and English studies, with the view of enabling them to reach the standard of the first arts examination of the University. With the present Arabic course, however, the arrangement must fail of its object, as sufficient time cannot be given to English studies."

271. The reports for 1864-65 and 1865-66 represent the condition of these institutions as unaltered. "They show," writes the Director of Public Instruction in his last-mentioned report, "but feeble signs of vitality, and under present arrangements little is to be expected of them."

The returns for the last three years are as follows:—

			Calcutta Madrissa.		Hooghly Madrissa.	
			Number of Students.	Expenditure.	Number of Students.	Expenditure.
				<i>Rs.</i>		<i>Rs.</i>
1863-64	-	-	108	17,937	23	5,448
1864-65	-	-	89	17,317	21	5,169
1865-66	-	-	72	16,389	19	3,009

The monthly fee is only eight annas.

272. In his Minute of 1858, the Lieutenant Governor of Bengal recommended the abolition of the Calcutta Madrissa; but the Government of India determined otherwise, as will be seen from the following extract from the orders of 2nd July 1860:—

Para 6.—"I am desired to state that the Governor General in Council, having carefully considered the case, does not think that the arguments advanced by the late Lieutenant Governor for the abolition of the Calcutta Madrissa are tenable on grounds of sound policy, neither is he at all able to concur in his Honour's estimate of the value of the institution.

* * * * *

12.—"Upon the whole, I am directed to state that the Government of India feels confident that the right and most advantageous course will be to continue to act in the spirit of the reforms of 1854; to do this carefully and not hastily; and to give to the principal, with this view, all the authority which he ought to possess, and which he will be able to exercise with the best effect, under the advice and control of the present Lieutenant Governor, who himself had a large share in settling the measures which were adopted for the reformation of this institution in 1854."

273. The Secretary of State, in reviewing the above orders, remarked as follows:—

Para. 5.—"I agree with your Government that it is not necessary to afford any artificial

artificial encouragement to the study of the Arabic language by giving it an undue preference over English or Persian; and I must beg that the remarks in the Despatch of the late Court of Directors of the 20th January 1841 may be borne in mind, and that the scholarships in the Madrissa be only given as the reward of merit, and that their continuance to particular students be dependent on good conduct and continued industry, to be tested by periodical examinations.

6.—“As the arrangements now sanctioned must be considered to be, in some degree, experimental, a special report as to their operation and result must be submitted after a period not exceeding two years from the date of your order of July last.”

No special report has yet been submitted.

274. I find, however, that in June 1864 the Bengal Government instituted an inquiry on the following points, viz. :—

(1).—Whether, by the adoption of some such plan as that introduced in the Sanscrit college, the present system of instruction in Arabic in the Calcutta Madrissa might not be amended and combined with instruction in English.

(2).—Whether such a measure would not bring the institution into harmony with the university system, and remove the objections at present felt by the Syndicate to its affiliation.

(3).—Whether it will not at the same time be carrying into effect those reforms which the Government of India and the Secretary of State have uniformly insisted on.

275. Respecting these inquiries, the principal of the Culcutta Madrissa wrote a long Report, dated 22nd October 1864, objecting altogether to the proposed remodelment; maintaining that, under existing arrangements, considerable progress had been made towards realizing the objects of Government, and giving the following opinion, viz. :—

“If the principles laid down in the Despatches of the late Honourable the Court of Directors of 1854, and the Right Honourable the Secretary of State of 1859, are to be upheld, the course, in regard to the Oriental classical languages, which is clearly indicated in those Despatches,* is the institution of a special faculty in the University for them, and placing the special Oriental colleges on the footing of the medical and civil engineering, or any other special colleges that are, or may hereafter be, founded; a course which, while it would not prevent the introduction into the colleges and schools for the general education of the people, of such moderate amount of instruction, in the grammar and construction of the Arabic and Sanscrit languages, as is absolutely necessary for the acquirement of a classical or more critical knowledge of the vernaculars, would, on the other hand, ensure that all students, graduating in either Arabic or Sanscrit, should possess a knowledge of English equal to that possessed by all graduates in medicine and civil engineering—a knowledge, we may assume, sufficient for all practical purposes.”

* *Vide* Court's Despatch of 1854, paragraphs 30, 31, and 32.

276. The director of public instruction, however, did not agree with the principal of the Calcutta Madrissa, and forwarded his Report to the Government of Bengal, with the following recommendation, viz. :—

Para. 10.—“I recommend, therefore, that the course of studies in the school department of the Madrissa be at once framed on the same plan as that of the Sanscrit college, Arabic taking the place of Sanscrit, with the addition of Persian as an optional subject, that a college department be added to this department, in order to educate the students up to the pass degrees in arts, while they enjoy facilities for keeping up their Arabic studies with the obtaining Arabic honours if they so desire; and, finally, that the present Arabic seminary be gradually allowed to die out.”

277. Proposals of a similar kind were, Mr. Atkinson informs me, made by him in 1860 for re-organizing the Hooghly Madrissa.

278. No orders have yet, however, been passed in either case.

279. In the North-Western Provinces, the Agra and Benares colleges were originally purely Oriental colleges.

280. The Agra college no longer stands in that list, as will be seen from the following extract from the Education Report of 1859-60, containing the substance of a recommendation made by the director of public instruction and approved by the Government, North-Western Provinces :—

“The Government should proceed on the principle of providing the people with what they cannot get elsewhere, or at least of so good a quality. In this category, instruction in the English language, and the study of English literature and European

science, may be included. But Arabic and Persian studies may be pursued, as well outside as within the college walls. It may be said, and with truth, that some knowledge of Arabic and of Persian grammar is essential to form a good Urdu scholar. Arabic and Persian grammar should form part of the Urdu course, so also the most popular Persian works, *e. g.*, the Gulistan and Bostan. But I advocate the abolition of a separate Arabic and Persian department. Let every student who attends our colleges and high schools learn English. This should be a *sine quâ non*. Mr. Fallon very justly remarks that the Oriental student is not brought under the influence of the European master; his moral education at the Government school under the Moulovee is not a whit better than it would be under a common Miyanji. The admixture of English and Oriental students is injurious to the former. I believe that the abolition of the purely Oriental department, while it might for a time decrease the number of students, would bring many boys into the English classes."

281. The following brief history of the Agra college is given in the Calcutta University Calendar for 1866-67:—

"Agra College is partly supported by Government, and is under the control of the director of public instruction, North-Western Provinces. It was established by the direction of the general committee of public instruction in 1823-24, and placed under the superintendence of a local committee, consisting of the Government officials of the place, with a paid secretary, who also acted as overseer of the institution.

"It was opened to all classes of the population, and 'was designed to diffuse more widely than native schools the possession of useful knowledge, to give a command of the language of ordinary life, and of official business—to teach, principally, Hindee and Persian, with the native mode of keeping accounts (Leelavattee), and to have instruction in Sanscrit and Arabic. It was not designed to impart an elementary education: the pupils were expected to have made considerable progress before their admission.'

"Separate teachers of Sanscrit, Hindee, Persian, and Arabic were appointed. All were taught gratuitously, and more than two-thirds of the whole received stipendiary allowances.

"Subsequently, in successive years, the introduction of new subjects, and the addition of new teachers, gradually changed the character of the institution, from that of a purely Oriental school to that of an Anglo-vernacular college, with upper and lower departments of study, having a principal, and containing (1862) no pupil who does not study English with Urdu or Hindee.

"ENDOWMENTS, &c.

"This college is endowed by a fund in the districts of Agra and Allyghur, amounting to about a lakh and a half of rupees, from villages formerly held by Gungadhar Pundit (who held his jagir, under educational services, from a late Rajah of Gwalior); the interest of which fund and the annual collection from the villages exceeded 20,000 rupees. To this have been added, from time to time, by Government, additional allowances for teachers, scholarships, &c., both sources of revenue amounting annually to about 35,000 rupees. There are also scholarships endowed by various private benefactors, amounting to 100 rupees a month."

282. The Benares College is thus briefly described in the same calendar:—

"The Benares Sanscrit College was founded by Government in 1791, for the cultivation of the language, literature, and (as inseparably connected with these) the religion of the Hindus. In 1830 an English institution was established, distinct from the Sanscrit College at first, but incorporated with it in 1853."

The continued existence of the special Sanscrit element in the Benares College would seem to be viewed by the director of public instruction as a practical failure, as may be gathered from the following extracts from his reports:—

(Report of 1862-63.)

Para. 24. "On the Sanscrit department, Mr. Griffith remarks—'There has been, I am willing to think, considerable improvement in the Sanscrit College during the year under review. Several reforms have been introduced and found to work well, but the college is still looked upon with affection by the orthodox Hindu as the nurse of his sacred language, literature, and philosophy, for the preservation of which it was established under the auspices of a liberal and enlightened governor. The pupils have been more regular in their attendance, and the Pandits have taught classes at once instead of single students. The results of the examination have been more satisfactory than usual.' The first two classes in this department have likewise made a marked advance in the knowledge of English.

25. "There are 124 students in the Sanscrit departments, 52 of whom received stipendiary allowances of from 2 to 16 rupees per mensem. This part of the college may

may, indeed, well be looked upon with affection by the orthodox Hindu. The State not only pays him to study his own sacred literature, but finds him the best guides and teachers that can be had, and supplies him with the comforts of a roomy building, where he can pore over his Shastirs, and bewilder himself with the philosophy of his ancestors. The philological study of Sanscrit, and its affinities with other languages, as throwing light on the history of antiquity, which is the chief incentive to its study in the eyes of the European scholar, is not attempted by these votaries of Hindu learning, who regard the language as holy, and its literature as holy, and imagine themselves to be sanctified by its study. This religious indulgence costs the State about 22,800 rupees a-year. Surely the wealthy inhabitants of Benares might maintain their own Patshala, which, if well conducted, would be eligible to receive a grant-in-aid from the State purse, just like any other missionary or religious institution. The philological study of Sanscrit is doubtless deserving of direct encouragement. This would be best effected by an offer on the part of Government of free quarters and tuition in Sanscrit to all scholars from European nations, who wished for an opportunity of studying the language at the probable scene of its currency as a living tongue.

26. "Last year 'the chair of Vedanta,' a kind of theological professorship, was, on the death of the pundit who held it, abolished. Other salutary alterations, such as the addition of English teachers to the staff, were carried out, and a European scholar will be placed in charge of the department under the orders of the principal. Such changes are regarded unfavourably by the pundits of Benares as innovations, the tendency of which is to diminish the paramount importance of the sacred language. Whether the study or the preservation of the sacred language be of importance to Her Majesty's Government or not, educationally speaking, the Sanscrit department of the Benares College is, from its very constitution, the least satisfactory part of the system of public instruction administered in these provinces."

(Report of 1863-64.)

Para. 16. "The principal reports, 'In the year under review there were 100 students in the Sanscrit College. Two general examinations were held in July and December. In the first poetry class, five students were considered worthy of prizes; in the first grammar class, seven. Ten students in the second grammar class, one in the first Nyaya class, two in the second Nyaya class, two in the first mathematical class, and one in the second; eight in the first Sunkhya class, and five in the second, were considered worthy both of scholarships and prizes. The progress made during the year in the Sanscrit College is not unsatisfactory.' From this statement, which is the sum total of the principal's report on the Sanscrit College, it will be seen that 29 per cent. of the Sanscrit students are scholarship-holders. The number of scholarship-holders in the English department of the college is seven and a-half per cent., but the holdings are more valuable.

17. "The results of the study of Sanscrit at the Benares College hardly yet come up to the expectation of its founders, which was that 'the genius of the more erudite alumni of our Oriental colleges would be in time so far developed as to induce a comparison between the systems and the interpretations of ancient India and modern Europe.' So far as this goes, the horizon of the future is still peopled with shadows in the clouds. The general order on the educational report of 1848-49 mentioned 'the endeavour to work upon the minds of the Sanscrit students through the medium of their own literature;' in 1849-50, it remarked 'the expectation of important results from the system pursued;' in 1850-51, 'the preparation of various works connected with the Sanscrit language and philosophy;' in 1851-52, 'the unabated efforts to impart knowledge and enlightenment to the learned classes of the Hindoos.' But at this date I am unable to discover that the 'erudite alumni' have worked any good in their day and generation. Even if Sanscrit be regarded as the parent stock from which the vernaculars of India gather vigour of expression, it does not appear that the study of Sanscrit now has any appreciable effect on the vernaculars of the North-Western Provinces, or that it has been a spur to literary enterprise. 'During the first quarter of 1863 only three new books were published at Benares. One of these was an almanac; another extracts from the *Qoran*, for beginners; and the other a book of poetry, composed a long time ago by the grandmother of the joint inspector. No new books were published in the second quarter, and only two during the third and fourth.'

"It is a pleasure to report progress, and the realization of well-considered plans, but it is none the less my duty to point out failure and disappointment; and surely it is hopeless to look for valuable results from a system of teaching in which (to use the words of an able essayist on this subject in 1853) 'the teacher's functions are transacted upon the principle that the theories which he expounds claim, both from himself and his disciples, the most exact submission and implicit credence; that upon them all the offices of reason and of judgment must be abandoned, and that beyond them every motive to investigation ceases. The extremest evils, both of lethargy and superciliousness, become inevitable.'"

283. In *Madras* the only Oriental institution is the *Madrisa-i-Azam*. The following

following extract from the education report of 1858-59 refers to a re-organization carried out in that year :—

“Arrangements were made during the past year for re-organizing the Madrissa-i-Azam, an institution which was established by the late Nawab of the Carnatic for the instruction of the Mahomedan population of Triplicane, and which has been adopted as a Government institution. It was found, on inspection, to be in a very inefficient condition; the attendance, though large, was extremely irregular, seldom exceeding one-half of the number of pupils nominally on the rolls. The amount of useful instruction imparted was extremely limited. The business of the institution, like that of its namesake at Calcutta, was teaching the Arabic and Persian languages, and the doctrines of the Mahomedan religion. All this has been altered. An efficient master has been placed at the head of the school; and the teachers generally have been replaced by more competent men, only two of the former staff having been retained. The course of instruction has been arranged on the model of that prescribed for the other Government schools; Hindoostani being made the medium of instruction in the lower classes, and English in the higher, and English being taught in all. The institution was opened on its new footing on the 1st May last; and, notwithstanding the enforcement of a more strict system of discipline, and alterations in the course of instruction, which are naturally distasteful to the Mahomedans, the number of pupils has already risen to 240, who attend with very tolerable regularity.”

284. In pointing out the difficulties attending the working of this institution, the Director of Public Instruction made the following remarks in his report of 1863-64 :—

“The difficulties attendant upon Mussulman education are much greater than those pertaining to the instruction of Hindoos; one of the principal is the advanced age at which Mahomedan lads commence their studies, another is the number of languages of which it is either necessary or desirable for them to obtain a knowledge. When a foreign language has to be acquired, its study should be commenced in early youth. In the case of the Mussulmans, however, this is not done, and the consequence is the obstacles in the way of success are greatly multiplied. Also, while a Hindoo has only English and a single vernacular to master, a Mahomedan youth attempts to combine the study of English, Tamil, or Telugu, Hindoostanee and Persian. Having regard to the circumstances mentioned, the progress of the Madrissa may be termed decidedly satisfactory; although, compared with the best among the Zillah schools, it necessarily takes a rather low position.”

285. The same difficulties exist still; but on the whole the institution seems, if anything, to be gaining ground, if we may judge from the following figures :—

		Pupils.	Number of Students of the Institution who passed the Matriculation Examination.
1863-64	- - - - -	238	2
1864-65	- - - - -	229	3
1865-66	- - - - -	297	3

286. The following remarks regarding the institution are taken from the Education Report of 1865-66 :—

“The Madrissa-i-Azam, which is an institution for Mussulman lads alone, ranks with zillah schools, and is commonly included in their number. The results of the Inspector's examination were not altogether favourable; and the numerical weakness of the senior classes, which involved as a consequence the expenditure of the labour of the senior and best paid teachers upon a comparatively small number of boys, was a matter for regret. At the same time, in trying to raise the standard a weak class has often to be allowed to exist temporarily; what is requisite is, that if the standard aimed at be found too high for the circumstances of the case, a lower one should be adopted. I trust, however, that the progress of Mussulman education will be such as to prevent any lowering of the standard aimed at in the Madrissa. From this institution six pupils went up to the matriculation examination, of whom three passed.”

287. In Bombay the Poona College was originally a Brahmin college for the cultivation

cultivation of the study of Sanscrit. I may repeat here the account of it already given under the general head of colleges :—

“On the occupation of the Deccan by the British Government in 1818, it was found that a certain portion of the revenues of the Maratha State had been yearly set apart for pensions and presents to Brahmins (Dakshina). To prevent hardship and disappointment, and to fulfil the implied obligations of the new rulers, the British Government continued these payments; but, as the pensions and allowances fell in, they resolved, while maintaining the same total expenditure, under the name of the Dakshina Fund, to devote a portion of it to a more permanently useful end, in the encouragement of such kind of learning as the Brahmins were willing to cultivate. With this view the Poona College was founded in 1821 as a Sanscrit college, exclusively for Brahmins.

“In 1837 some branches of Hindoo learning were dropped; the study of the vernacular and of English was introduced, and the college was open to all classes; and, after having been amalgamated with the English school in 1851, it arose in its present form in 1857, by a separation of the college division from the school division. From another portion of the Dakshina Fund Dakshina fellowships have been founded, of which four, viz., one senior fellowship of 100 rupees per mensem, and three junior fellowships each of 50 rupees per mensem, are attached to the college.”

288. The following remarks respecting the Sanscrit branch of the Poona College are taken from Mr. Howard's pamphlet of 1865. They relate to the comparatively recent re-organisations carried out :—

“The ‘Sanskrit Department’ was marked for a root and branch reform.

* * * * *

“I have mentioned the Sanscrit department of Poona College. This consisted of a crowd of half naked Brahmins, mostly beggars, taught by pundits on the indigenous system. The pupils were either stipendiary scholars or free. They learned nothing but Sanscrit, and that not well. Most of them became priests after leaving college. Their teachers the ‘shastrees’ were ignorant of all human knowledge save the ‘shastra’ professed by them. They were also arrogant and obstructive. They had as little notion of order or discipline as they had of literature or science. No learned book or philosophical tract, or critical reprint, ever proceeded from Poona College. When a descriptive catalogue of the Sanscrit manuscripts in the library was asked for, the shastrees simply confessed that they did not know how to make one. After some hesitation, it was resolved to abolish a department which seemed a standing protest against all the other reforms introduced into Poona College. The remaining pupils were merged in the ‘English’ department, and the shastrees were bid to teach Sanscrit to all comers in the college and school. They refused to instruct in the sacred language any but Brahmins, and were put on half pay. A native of liberal ideas and European knowledge was set to direct the Sanscrit studies, which henceforward were to be pursued not in the spirit of Brahminical theology, but as a branch of general learning. Finally, in the following year, a German Orientalist was brought from Europe as permanent professor of Sanscrit.

“Dr. Martin Haug, known chiefly by his researches in Zoroastrian antiquities, came to India in November 1859 and at once joined the college at Poona. He has the honour of organising, almost of creating, a genuine study of Sanscrit in Western India. His original investigations into Vedic and Zend antiquity, carried on side by side with his teaching, gave him importance among even the pundits and the dasturs. The English bred natives gladly accepted the methods of scientific philology. Among Dr. Haug's pupils are men who combine the accumulated knowledge of the pundits with the critical acumen of the European philologist. One of these scholars, a Maratha Brahmin, in 1863 took University honours in ‘Languages,’ of which one was Sanscrit, the second being English.

“In February 1863, another learned German, Dr. George Bühler, was appointed Sanscrit professor in Elphinstone College. Previously the Duxina fellows and a shastree had taken the Sanscrit classes in this class.

“Sanskrit is now taught in the vernacular colleges, and many schools, English and vernacular. I believe that the Hindoos are much gratified by finding their ancient language again in honour. A reflex result has been to diffuse a taste for Sanscrit among the people of Western India. I have before me a rather remarkable proof of this result. In the last monthly catalogue of Oriental literature on sale at a London publishers, I find a list of 46 Sanscrit works all printed in India. Of these 25 come from Calcutta, Benares, and other places, and all the rest from either Bombay or Poona.

289. The following account of the spread of the study of Sanscrit in Bombay is taken from the Director's Report for 1865-66 :—

“Great impulse has been given of late to the study of Sanscrit in this Presidency. Firstly, by the excellent professors of the language in Elphinstone and Poona Colleges;

secondly, by the University rule requiring this or some other classical language to be brought up for the arts examinations; thirdly, by the foundation of the Bhugwandass Purshotumdass Sanscrit scholarship for bachelors of arts; fourthly, by the publication of a first Sanscrit book by Mr. Ramkrishna Gopal Bhandarkar, M.A.; fifthly, by the liberality of Mr. Vinayakrao Sunkersett, who has recently founded two annual Sanscrit scholarships, styled, in honour of his late father's memory, the Juggonath Sunkersett Scholarships, which are to be contended for in connection with the University matriculation examination. Soon every high school in this department will be a school for Sanscrit scholarship. And this will be a great advantage, for Sanscrit studied according to the European method, and in conjunction with English, cannot fail to strengthen the minds of native students.

"In connection with this subject, I beg to call attention to a letter from Professors Bühler and Kielhom (subjoined in Appendix H., page 196) proposing a series of Sanscrit classics to be brought out by themselves and by native Sanscritists under their superintendence. This excellent proposal is now being carried out, and it will, I trust, result in furnishing us with good and cheap texts of Sanscrit classics to be used in our high schools and colleges, and possibly to be adopted by educational institutions elsewhere."

290. Before passing from this subject, I may refer to the movement which recently took place in the Punjab on the part of the native nobility and gentry of Lahore, towards the introduction of a scheme for encouraging and directing the progress of Oriental literature and science. The best reference to the movement in question will be an extract from the reply of the Lieutenant Governor (Sir Donald McLeod) to the address of the native nobility. The reply was given in February 1866; and the following extract will show something of its nature:

"It is with no ordinary satisfaction that I have received from the hands of Dr. Leitner your address regarding the scheme which you have devised, and have partially set on foot, for encouraging and directing in this Province the progress of Oriental literature and science, and the spread of knowledge through the vernaculars; I have felt greatly gratified to find that the few words addressed by me to the Director of Public Instruction have been taken up, and the views which I urged in them expanded by you, with an earnestness and cordiality which I had no right to expect for them. Your learned and truly sympathising friend and adviser, who has come some hundreds of miles to deliver your address, and communicate your feelings and desires, has had the benefit, not only of drawing largely from the founts of European knowledge, but of mixing much and freely with Oriental races in other lands, whereby he has been enabled to discriminate all that is calculated to be unsuitable or distasteful to you, from what may be turned to good account, and likely to prove, if judiciously worked out, of the highest value. I feel very grateful to him for having thus apprehended, and pointed out to you the way, and to you for having thus far so generously and so heartily followed it."

"Some among you may doubtless be aware, though all of you cannot be so, that in 1835 A.D. under the auspices of Lord William Bentinck, the Governor General of India, the rules and principles to be followed by Government and its officers, in the work of education, were placed on a new basis. Amongst those who were the main advisers and promoters of this measure are to be found the names of Macaulay, Trevelyan, Duff, and others well known as amongst the most enlightened and earnest friends of the natives of Hindoostan. Dissatisfaction was justly felt and avowed by them at the meagre results which had previously been attained by efforts made to convey instruction to the people through the languages of the country; and it was determined that thenceforth the English language should be chiefly relied on as the means of imparting to our subjects in this land the knowledge of the West.

"Up to that time no serious effort had been made to employ those languages as a medium for imparting the knowledge which European nations most value, so that it is no matter for surprise that such dissatisfaction should have been felt. But there were at the time not a few who were of opinion that the scheme of education then determined upon was too exclusive, as well as practically ungenerous, from omitting and decrying all that you value the most. And although great progress has undoubtedly been made since then, many distinguished and enlightened scholars have been raised from amongst your countrymen, and the desire for education has greatly increased on every hand, there are now a still larger number amongst us, and I must avow myself to be one of this number, who consider that the results which have been attained show that opinion to have been correct, inasmuch as, notwithstanding some brilliant exceptions, the great bulk of our scholars never attain more than a very superficial knowledge, either of English or of the subjects they study in that language, while the mental training imparted is, as a general rule, of a purely imitative character, ill calculated to raise the nation to habits of vigorous or independent thought.

"It appears indeed evident that, to impart knowledge in a foreign tongue must of necessity greatly increase the difficulties of education. In England, where the Latin and Greek languages are considered an essential part of a polite education, all general instruction

instruction is conveyed, not in those languages, but in the vernacular of the country; and it seems difficult to assign a sufficient reason why a different principle should be acted upon here. It was doubtless hoped, by the eminent men who inaugurated the revised arrangements, that as youths were sent forth from our collegiate institutions, thoroughly imbued with a taste for the literature, science, and art of other lands, and gifted with superior attainments in these, they would devote themselves to facilitating the path for their fellow-countrymen; and that a vernacular literature of a superior order would thus spring up. But the necessity for creating such a literature does not appear to have been practically kept in view; and it is an undoubted fact that, up to the present time, as regards Oordoo and Hindee, the vernacular languages of Upper India, little or no progress has been made towards the attainment of this end. So that your countrymen have as yet no means afforded them of acquiring, in their own languages, some fair portion at least of that knowledge of which such abundant stores exist in the languages of the West.

“Nor do I feel at all hopeful that anything like a vigorous, original, or copious vernacular literature will be produced within our generation, unless very special efforts be made for securing this end. While the system now in force appears to me but ill-adapted for such a purpose, the amount of time which is necessary to devote to the various subjects studied in our schools, where these are taught in the English language, leaves but little time for perfecting our pupils in their knowledge of that language itself. Many parents have complained to me of this as regards their sons; and it cannot be denied, at least as far as this Province is concerned, that a really good English scholar is but rarely produced even from amongst those who have matriculated at the University. Vigorous mental training appears to be but little aimed at; while the youths who are attracted to our schools or colleges, are for the most part those who desire only to qualify themselves for public employ, or to acquire a colloquial knowledge of English, seldom or never including youths of those classes who are used to devote themselves wholly to the cause of learning.

“And this brings me to the defect, which I myself more especially deplore, in the system of instruction at present almost exclusively followed, viz., that it has tended, though not intentionally, to alienate from us, in a great measure, the really learned men of your race. Little or nothing has been done to conciliate these, while the literature and science which they most highly value have been virtually ignored. The consequence has been that the men of most cultivated minds amongst our race and yours have remained but too often widely apart, each being unable either to understand or to appreciate the other. And thus we have virtually lost the aid and co-operation of those classes who, I feel assured, afforded by far the best instruments for creating the literature we desire. This is, in my opinion, very much to be lamented; and where a different policy has been pursued by individuals following the bent of their own instincts, and striving to attain a better knowledge of those by whom they are surrounded, I have myself witnessed the most remarkable and gratifying results.

* * * * *

“I by no means intend, however, by what I have said above, that the study of your own classic authors should be your end and sole aim in the educational measures you may devise for your fellow-countrymen; but I desire to direct your attention to their works, because they have been almost wholly overlooked in existing educational schemes, and because I am convinced that, if rightly employed, they will prove a most important addition to the means of mental culture at present employed. I know how deeply you value and revere these, and respond to any appreciation of them by others. I know that they contain much that is of great value, and I know too how admirably adapted many of them are for training the minds of youths to vigorous habits of thought.

* * * * *

“I think it premature to discuss at the present time, and in this place, some of the measures urged in your address, such as conferring on your institutions authority to grant diplomas, degrees, &c., and giving the preference for Government employ to those applicants who may be thus distinguished. But as your arrangements become more matured, we may hope that such points will be adjusted in a manner satisfactory to you, and that every reasonable concession will be gladly made by those with whom the power rests. There are, however, a few points to which it is necessary that I advert before concluding this reply.

“*First.*—You request that your principal educational institution, or whatever designation may be ultimately determined for it, may be honoured by the patronage of Her Majesty the Queen of England. And on this point, all that I can promise is that so soon as your proceedings shall have become further advanced, and one or more institutions shall have been established on improved principles, I will submit your request for the favourable consideration of the Supreme Government, with a view to its transmission to the Right Honourable the Secretary of State for India, and submission by him, should he deem this fitting, for the consideration of Her Most Gracious Majesty. The hearty and effective manner in which his Excellency the Viceroy has spontaneously evinced his approval of your project affords sufficient guarantee that you will have his

cordial

cordial support, and none of you can doubt with what deep interest Her Majesty regards all that may conduce to the benefit of Her Indian subjects.

"Secondly.—You request me to secure, as far as possible, the pecuniary aid of Government in the form of an equivalent to the entire amount of donations collected from private parties, and a grant-in-aid equal to the amount of annual subscriptions. The returns which accompany your address show that, at the time of its preparation, donations amounting to 8,138 rupees, and yearly subscriptions aggregating 7,181 rupees per annum had been promised. These are large amounts; and as the above include only the subscriptions of his Excellency the Viceroy, and his Highness the Rajah of Kappurthulla, with the contributions of the communities of Lahore and Umritsur, while other localities have already intimated their desire to co-operate, larger sums may be looked for as your proceedings become more generally known. Whether it will be possible for Government to supplement all the income thus derived from private sources I cannot undertake to say, but I have entered in the Budget for the coming year, on this account, such a sum as it has appeared to me reasonable to propose; and I venture to entertain a confident hope that, for the encouragement of educational efforts so entirely in accordance with the views set forth in the Educational Despatch of 1854, on which all grants-in-aid are based, the Government will gladly concede such amount as the state of the finances may permit, without impairing the direct operations of Government through its own educational institutions.

"Lastly.—You urge that the fixed endowment of your institutions may be allowed to take the form of a jaghire, yielding a yearly income equal to the interest of the aggregate donations of the public, with Government equivalent. I am not aware why a jaghire should be preferred, as an endowment to an investment in the promissory notes of Government, or other suitable securities. The Supreme Government has frequently expressed a strong disinclination to make over to a jaghirdar, who has not heretofore held their lands of which the proprietorship belongs to other parties, and although the same objections might not perhaps exist, to conferring a new jaghir on an educational body, which could have no concern with its management, and would simply enjoy the yearly revenues, it is not apparent to me what special advantage could result from such an arrangement, while it might in some respects prove inconvenient to the grantees themselves. If, however, any definite and well-considered proposal to this effect be hereafter submitted, I shall be prepared to give it my careful attention."

SECTION VIII.

SCHOLARSHIPS.

291. The system which the Home Government recommended for introduction in 1854 is briefly sketched as follows in the Despatch of that year:—

"The system of free and stipendiary scholarships, to which we have already more than once referred as a connecting link between the different grades of educational institutions, will require some revision and extension in carrying out our enlarged educational plans. We wish to see the object proposed by Lord Auckland in 1839, 'of connecting the zillah schools with the central colleges, by attaching to the latter scholarships to which the best scholars of the former might be eligible,' more fully carried out; and also, as the measures we now propose assume an organized form, that the same system may be adopted with regard to schools of a lower description, and that the best pupils of the inferior school shall be provided for by means of scholarships in schools of a higher order, so that superior talent in every class may receive that encouragement and development which it deserves. The amount of the stipendiary scholarships should be fixed at such a sum as may be considered sufficient for the maintenance of the holders of them at the colleges or schools to which they are attached, and which may often be at a distance from the home of the students. We think it desirable that this system of scholarships should be carried out, not only in connection with those places of education which are under the immediate superintendence of the State, but in all educational institutions which will now be brought into our general system."

292. I now proceed to notice the system of scholarships in force in each Presidency and Province.

Bengal.

293. The Bengal scholarships are open to competition not only to Government but to private institutions, as will be seen from the following extract from the Bengal Report of 1863-64:—

"In Bengal the Government scholarships of every description have, for some years, been thrown open on equal terms to all educational institutions, Government and private, without exception. The removal of all restrictions in the competition for

for the public rewards of successful study has proved no less beneficial in practice than it is theoretically correct and just in principle, for open competition effectually stimulates emulation among the schools and colleges of all classes, and affords an indisputable test of their comparative efficiency, while it cuts away the grounds for dissatisfaction which private institutions must naturally and reasonably feel when they find themselves debarred from the substantial rewards bestowed on approved proficiency in institutions under Government control. Amongst the various measures adopted for spreading education and improving the character and standard of instruction in schools of all classes, the scholarship system must be regarded as second to none in practical efficacy, and a further extension of it would, I believe, be attended with advantages fully adequate to the consequent outlay."

294. The several grades of scholarships in Bengal are as follows :—

I. *Vernacular Scholarships*.—Of these 225, or about 10 in each district, are annually open to competition among the pupils of vernacular schools who may wish to continue their studies in higher class schools. These scholarships are worth four rupees per mensem, and are tenable for four years in higher class schools. A similar number (225) of scholarships are annually available for such of the pupils of vernacular schools as may wish to qualify themselves as teachers. These scholarships are tenable for one year in normal schools, or in zillah schools, where arrangements can be made for their proper training.

II. *Minor English Scholarships*.—The scholarships mentioned above being restricted to pupils of vernacular schools, it was deemed advisable to offer some similar encouragement to pupils of middle class Anglo-vernacular schools who might wish to continue their studies in higher class schools. To meet this want 200 scholarships of five rupees per mensem each were instituted in 1864-65. Of these 100 are available annually, each scholarship being tenable for two years. They are held in English schools of the higher class, the standard of examination being so fixed that successful candidates should be sufficiently advanced to be able to pass the university entrance examination at the expiration of their scholarship term.

III. *Junior Scholarships*.—These are for undergraduates studying for the first arts examination. The rules, as revised in February 1865, are given below :—

"One hundred and sixty junior scholarships are open annually to be competed for in the university entrance examination by candidates educated in any school in the Lower Provinces of Bengal.

"2. These scholarships are of the three grades: 10 of the 1st grade with stipends of (18) eighteen rupees per mensem; 50 of the 2nd grade, with stipends of (14) fourteen rupees per mensem; and a 100 of the 3rd grade, with stipends of (10) ten rupees per mensem.

"3. With the sanction of the Director of Public Instruction, a junior scholarship may be held at any one of the 'affiliated' colleges which may be selected by the holder.

"4. Each scholarship is tenable for two years, provided that due progress, under a collegiate course of instruction, is regularly made by the holder; a certificate of the fact being submitted, at the end of the first year, by the Principal of his College.

"5. The holder of a junior scholarship in a non-Government institution is liable at any time to be examined by two persons appointed by the Director of Public Instruction, and approved by the principal of the college to which he belongs, and, on proof of unsatisfactory progress, may be deprived of his scholarship.

"6. No candidate is eligible who did not study for the last 12 months at least in the school to which he belonged at the time of presenting himself at the entrance examination.

"7. The 10 scholarships of the first grade will be awarded to the 10 candidates who obtain the greatest number of marks in the entrance examination.

"8. The 50 scholarships of the second grade are reserved for schools situated within the five collegiate circles of Calcutta, Hooghly, Kishnaghur, Berhampore, and Dacca,* 10 scholarships for each circle, and will be awarded to the 10 highest candidates from each who do not gain scholarships of the first grade, provided their names appear in the first division.

"9. Fifty scholarships of the third grade are similarly reserved for the five collegiate circles, 10 for each circle, and will be awarded to the 10 highest candidates from

* The Hooghly Circle includes Howrah, Hooghly, 24-pergunnahs, Baraset, Midnapore, and the Province of Orissa.

The Kishnaghur Circle includes Nuddea, Burdwan, Jessore, Pubna, Beerbhoom, Bancoorah, and Puruliya.

The Berhampore Circle includes Moorshedabad, Rajshahi, Maldah, Dinajpur, Darjeeling, and the Province of Behar.

The Dacca Circle includes Dacca, Fureedpore, Bograh, Burrisal, Chittagong, Tipperah, Sylhet, Cachar, Khasia, Mymensing, Rungpur, and Assam.

The Calcutta Circle includes the town of Calcutta only.

from each who do not gain scholarships of the first or second grade, provided their names appear either in the first division or in the upper half of the second division.

"10. The scholarships not taken up under the two preceding rules by the circles for which they are reserved will be awarded to candidates from the general list in order of merit, provided they reach the prescribed standard.

"11. The remaining 50 scholarships of the third grade will be awarded, at the discretion of the Director of Public Instruction, to candidates who pass the examination, and appear deserving of reward and encouragement, although they may fail to reach the standard prescribed in the foregoing rules.

"12. The holders of scholarships in all Government colleges are required to pay the usual monthly fees which are levied from other students, provided always that no scholarship holder shall be required to pay a higher fee than (5) five rupees per mensem."

IV. *Senior Scholarships.*—These are for under graduates who have passed the first arts examination, and continue their studies for the B.A. degree." I give below the present senior scholarship rules:—

"Twenty-four senior scholarships are open annually, to be competed for in the first examination in arts by candidates educated in colleges affiliated to the University of Calcutta.

"2. These scholarships are of two grades; nine of the 1st grade, with stipends of (32) thirty-two rupees per mensem, and 15 of the 2nd grade, with stipends of (27) twenty-seven rupees per mensem.

"3. With the sanction of the Director of Public Instruction, a senior scholarship may be held at any one of the 'affiliated' colleges which may be selected by the holder.

"4. Each scholarship is tenable for two years, provided that due progress, under a collegiate course of instruction, is regularly made by the holder, a certificate of the fact being submitted at the end of the first year by the principal of his college.

"5. The holder of a senior scholarship in a non-Government institution is liable at any time to be examined by two persons appointed by the Director of Public Instruction, and approved by the principal of the college to which he belongs, and, on proof of unsatisfactory progress, may be deprived of his scholarship.

"6. Second year students alone are eligible, *i. e.*, those students who passed the entrance examination two years before presenting themselves for the first examination in arts.

"7. The nine scholarships of the 1st grade are open generally to all 'affiliated' institutions without restriction, and will be awarded to the nine candidates who obtain the greatest number of marks in the first examination in arts.

"8. The 15 scholarships of the 2nd grade are reserved for the 'affiliated' institutions situated within the five collegiate circles of Calcutta, Hooghly, Kishnaghur, Berhampore, and Dacca*, three scholarships for each circle, and will be awarded to the three highest candidates from each circle who do not gain scholarships of the 1st grade, provided their names appear in the upper two-thirds of the list of passed candidates, as determined by the marks of the examiners. No candidate whose place is lower than this will be entitled to claim a scholarship.

"9. Scholarships, not taken up under the preceding rule by the circles for which they are reserved, will be awarded to candidates from the general list in order of merit, provided they reach the prescribed standard.

"10. The holders of scholarships in all Government colleges are required to pay the usual monthly fees which are levied from other students."

295. The rules for senior scholarships will have to be modified in January 1868, when a revised scale of senior scholarships recently sanctioned will come into force. The total number of scholarships is to be increased from 24 to 40, and to be of the following values:—

10	at 32 rupees.
12	at 25 "
18	at 20 "

296. Besides the above there are the "graduate scholarships" or foundation scholarships of the Presidency College. These appear to be awarded annually.

No

*The Hooghly Circle includes Howrah, Hooghly, 24-pergunnahs, Baraset, Midnapore, and the Province of Orissa.

The Kishnaghur Circle includes Nuddea, Burdwan, Jessore, Pubna, Beerbhoom, Bancoora, and Puruliya.

The Berhampore Circle includes Moorshedabad, Rajshahi, Maldah, Dinajpur, Darjeeling, and the Province of Behar.

The Dacca Circle includes Dacca, Furreedpore, Bogra, Burrisal, Chittagong, Tipperah, Sylhet, Cachar, Khasia, Mymensing, Rungpur, and Assam.

The Calcutta Circle includes the town of Calcutta only.

No description of them is given by the Director in his reports ; but in 1865-66 seven were awarded to bachelors of arts tenable for one year on condition of their prosecuting their studies for the M. A. degree. The average value of them was about 38 rupees per mensem.

There are also special scholarships for Sanscrit and Arabic and for the Medical College. The following statement of expenditure on scholarships in Bengal is given in the Report for 1865-66 :—

					Rs.
Senior scholarships	-	-	-	-	16,632
Junior - - ditto	-	-	-	-	41,880
Graduate - ditto	-	-	-	-	3,510 from local funds.
Arabic- - - ditto	-	-	-	-	5,856
Sanscrit - - ditto	-	-	-	-	4,032
Minor English ditto	-	-	-	-	956
Vernacular ditto	-	-	-	-	28,670
Medical college ditto	-	-	-	-	14,564
TOTAL - - Rs.					1,16,100

North Western Provinces.

297. In the North Western Provinces, there are two classes of scholarships as follows :—

(1.) *Junior Scholarships.*—Five thousand six hundred rupees per annum has been sanctioned for these scholarships. They are worth three rupees each per mensem, and are given to pupils of Tehseelee and Anglo-vernacular schools selected by the inspectors on condition of their proceeding to one of the boarding house colleges in the North Western Provinces to pursue their studies. They appear to be tenable in some cases for three years, and other cases for one year.

(2.) *Scholarships for the three Upper Classes of the Schools.*—Their value is from four rupees to eight rupees each per mensem. They are awarded on the result of an examination by a board of examiners. They appear to be tenable only for one year.

(3.) *Senior Scholarships.*—These are for students pursuing their studies in college after passing the entrance examination, first arts examination, or B. A. examination. There are no specific rules fixing their number or the period for which they are tenable. They vary in amount from 10 rupees to 25 rupees. In 1866, the allotments for such scholarships numbered 37.

298. The total expenditure on account of scholarships in the North Western Provinces for 1865-66 was 17,962 rupees. There is a great want of specific information respecting the scholarship system of the North Western Provinces, which probably arises from the absence of any specific rules or regulations respecting the number and value of the scholarships of each class available annually, the period for which they are to be tenable, and the conditions under which they are to be awarded.

Punjab.

299. In the Punjab there are two kinds of scholarships, as follows :—

(1.) Scholarships given to pupils of zillah schools as rewards and encouragements to continued study.—Of late years the Director of Public Instruction has confined these scholarships as much as possible to pupils who, having completed their course in an inferior school, proceed to a higher school to continue their studies. The total number of such scholarships in 1865-66 was 215, of an average amount of about Rs. 2. 12. each per mensem.

(2.) Scholarships given to matriculated students continuing their studies in colleges.—When the two colleges at Delhi and Lahore were established, an allowance of 100 rupees each was sanctioned for scholarships. The Punjab Director asked that this amount might be doubled, his idea being that every student who attended college should have a scholarship; and, that, if this were not given, all, or nearly all, the students not getting scholarships would disappear. As a temporary arrangement it has been decided to allow one scholarship for every three students attending the college, the value of such scholarships corresponding to the average value of the junior and senior scholarships in Bengal.

Madras.

300. Nothing is said about scholarships in the Madras Report for 1865-66. The following extract from the Report of the previous year may be given :—

Scholarships.

Para. 278.—"The bulk of the expenditure on scholarships continues to be in connection with professional training, either in normal schools, or in the lower departments of the medical and civil engineering colleges. To meet, however, the increase in the number of matriculating students, 15, instead of as last year 10, scholarships of 10 rupees per mensem were offered for competition at the matriculation examination in February 1865, and provision was made by an increase to their stipends for the incitement of scholarship-holders to secure a place in the higher class at the first examination in arts. The rules laid down regarding the scholarships are subjoined :—

"1.—Every candidate must be a pupil in some institution.

"2.—At the time of examination, the age of a candidate must not exceed 19 years.

"3.—The candidate must obtain places in the 1st class at the examination; and they must further secure at least one-third of the total marks assigned to the English language.

"4.—The candidates must engage to prosecute their studies up to the B. A. standard, and to offer themselves for examination with the view of obtaining the degree of bachelor of arts within three years after their nomination to the scholarships.

"5.—As two years must elapse between the date of passing the first examination in arts and that of attending the B. A. examination, a student nominated to a matriculation scholarship will forfeit it in case of his failing to pass the first examination in arts within one year from the award of his stipend.

"6.—The scholarships will be tenable for three years, supposing the holders to pass the first examination in arts at the prescribed time, and to conduct themselves in a satisfactory manner.

"7.—The successful candidates must, if not already in one, enter some college or school in which satisfactory provision is made for educating students up to the B. A. standard.

"8.—In case of a scholarship-holders obtaining a place in the 1st class at the first examination in arts, an addition of five rupees per mensem will be made to his stipend during the concluding two years of his preparation for the B. A. examination."

301. From the statistical return appended to the Madras Report of 1865-66, it appears that 149 scholarships tenable in normal schools were gained during the year, besides 24 free studentships in the same institutions. Only eight scholarships appear in the list as tenable in institutions for general education; of these six belonged to the provincial school at Combaconum, and two to the provincial school at Bellary.

Bombay.

302. There is a deficiency of recent information respecting scholarships in Bombay. The subject is not mentioned by the Director in his report, and the prescribed statistical table respecting scholarship-holders has been omitted from the Appendices.

303. It was in 1863-64 that a scheme of scholarships or exhibitions to be held at high schools by boys coming from other inferior schools to prosecute their studies was first fairly brought into operation. In that year the exhibitions of this class numbered 142, varying in value from three rupees to 10 rupees per mensem each. The system appears to have worked well; it has greatly increased the influence of high schools by filling their benches with boys from all parts of the country.

304. There are also college scholarships in the Poona and Elphinstone Colleges. The following extract from Mr. Howard's Memorandum of June 1865 gives an account of the way in which the college scholarship system had of late years been re-organised :—

"The system of scholarships and free studentships at each college was re-organised. The funds were applied chiefly to the purpose of encouraging the senior men to persevere through a full college course. For instance, in Elphinstone College the junior scholarships (first and second year) were reduced from 36 to 20; the senior scholarships

ships were raised from 9 to 20. The 38 scholarships of the Poona College, originally tenable for 10 years each, and half of them held by school children, were by degrees confined to the college classes, and 16 were reserved for young men who had already gone through two years of college study. Free studentships, which had been lavished too freely, were retrenched. The effect of these measures was to clear each college of many idlers, and to form a compact group of promising senior students.

"At the same time annual examinations were set on foot for junior and senior scholarships according to printed standards. The candidates for the former were for the most part also candidates for college entrance or matriculation. The candidates for the latter had completed two years at college. The senior scholarship examinations were to be conducted by persons not professors in the colleges."

305. A brief notice may here be taken of the "Duxina Fellowships," of which the following account is given in Mr. Howard's Memorandum :—

"Connected with the reform of the colleges was the foundation of a set of native fellowships and tutorships. Since the conquest of the Dekkan the Bombay Government had, for political reasons, continued the practice of the Maratha Court of granting annuities called "Duxina" to Brahmins. The allowance applicable to this purpose was separately credited in the accounts of the British Government. For some years, however, no new annuity had been granted, and there was in hand an accumulated balance of the "Duxina Fund," which was yearly increased by lapses on the death or (sometimes) the misconduct of annuitants.

"In 1858 the Government gave their sanction to a scheme of providing by means of the unexpended balance of Duxina, five senior and 10 junior fellowships, to be attached to one or other of the colleges on conditions mentioned in the director's Annual Report for 1857-58. Two benefits were expected from this arrangement :—First the young men elected fellows—presumably the best men of the University—would thus, like the fellows of colleges at home, be detained for a few years among the influences of a learned life ; and then they would supply to the colleges the *native tutorial element*, the value of which the ablest European professors have often insisted on. There are now five Duxina fellows and tutors in Elphinstone College, and four in Poona College. It has been stated, and it may be believed, that the foundation has quite answered all reasonable expectations."

Oude.

306. In Oude there are only a few school scholarships paid to pupils in Zillah and Tehsil schools from subscriptions, the aggregate amount for 1865-66 being 1,079 rupees.

307. Six under-graduates in the Canning College received scholarships of 10 rupees each per mensem from the college funds. A sum of 2,520 rupees was sanctioned by the Government of India for scholarships in Oude for the year 1866-67.

Central Provinces.

308. Only 696 rupees were spent in scholarships in the Central Provinces in 1865-66. They were allotted among the Zillah schools ; their value varying from one rupee to eight rupees each per mensem.

The question of making further provision for scholarships in the Central Provinces has since been under consideration.

Mysore.

309. There are no scholarships in Mysore.

SECTION IX.

EMPLOYMENT OF STUDENTS IN THE PUBLIC SERVICE.

310. This subject is one which has obtained a considerable amount of attention in some parts of India and was expressly referred to by the Home Government in the educational Despatches of 1854 and 1859.* In the former Despatch allusion was made to a Resolution of the Government of India, dated the 10th October 1844, the object of which was to afford to educational measures "every reasonable encouragement, by holding out to those who have taken advantage of the opportunity of instruction afforded to them a fair prospect of employment in the public service, and thereby not only to reward individual merit,

* See paras. 72-77, despatch of 1854. See para. 63, despatch of 1859.

but to enable the State to profit as largely and as early as possible by the result of the measures adopted of late years for the instruction of the people." The Resolution had, it would seem, primary if not exclusive reference to ministerial appointments. Returns were directed to be furnished by educational officers of "students qualified for the public service," and the heads of offices were enjoined to "omit no opportunity of providing for and advancing the candidates thus presented to their notice, and in filling up every situation, of whatever grade, in their gift, to show them an invariable preference over others not possessed of superior qualifications."

311. It was observed, in the Despatch of 1854, that the requisition for lists of meritorious students had failed, but that the object in view would be attainable on the establishment of universities, "as the acquisition of a degree, and still more, the attainment of university distinctions, will bring highly educated young men under the notice of Government." In directing, therefore, that the Resolutions in question should be revised, so as practically to carry out the object in view, the following statement was made of what that object was :—

"What we desire is, that where the other qualifications of the candidates for appointments under Government are equal, a person who has received a good education, irrespective of the place or manner in which it may have been acquired, should be preferred to one who has not; and that, even in lower situations, a man who can read and write be preferred to one who cannot, if he is equally eligible in other respects.

"76. We also approve of the institution of examinations, where practicable, to be simply and entirely tests of the fitness of candidates for the special duties of the various departments in which they are seeking employment, as has been the case in the Bombay Presidency. We confidently commit the encouragement of educated in preference to uneducated men to the different officers who are responsible for their selection; and we cannot interfere by any further regulations to fetter their free choice in a matter of which they bear the sole responsibility."

312. In 1856 the Government of India passed a Resolution the primary object of which was to lay down general instructions respecting the ascertainment by examination of the qualifications of such "uncovenanted officers in the several branches of executive administration as are entrusted with independent authority, and empowered to exercise the functions of covenanted assistants in either the magisterial or revenue departments of the public service;" but which also expressed a desire in respect of employment in the lower grades, "that all officers having in their hands the selection of persons for such employment may be guided by the general principle of examining candidates with a view to test their general as well as special qualifications, and of giving the preference to those who are educated and well informed over those who are not, when both are equally well qualified for the special duty required."

313. In the Despatch of 1859 the Secretary of State communicated the following remarks :

"It has long been the object of the several Governments to raise the qualifications of the public servants even in the lowest appointments; and by recent orders no person can, without a special report from the appointing officer, be admitted into the service of Government on a salary exceeding six rupees per mensem who is destitute of elementary education; and elaborate rules have been framed by which a gradually ascending scale of scholastic qualification is required in those entering the higher ranks of the service. It may be anticipated that many years will elapse before a sufficient number of educated young men are raised up in India to supply the various subordinate offices in the Administration in the manner contemplated by the new rules."

314. I now proceed to the main object of this section of the note, viz., to sketch the measures which have been taken in each Presidency or Province for giving effect to the above principle, and the result which has attended them.

Bengal.

315. In Bengal the complaint of the Education Department has, for many years, been, that the orders of Government on this subject had become a dead letter; but it will be seen, from the following extract from the Bengal Report of

of 1865-66, that something has recently been done towards enforcing the principle enunciated in 1855-56 :—

“ With reference to representations that have been frequently made by this department regarding the employment of uneducated persons in the public offices in the Mofussil, the Lieutenant Governor has issued fresh instructions confirming, with some amendments, the Resolution* of 30th January 1856, which laid down the principles upon which the admission of candidates for ministerial employments in Mofussil offices is to be regulated.

* Appendix B. of Report for 1855-56.

“ The main object of the Resolution was the encouragement of education by giving preference to educated candidates in the disposal of all public appointments. But the orders of Government on this subject having in most districts been forgotten or disregarded, measures have now been taken to enforce the observance of them; for which purpose some rules of procedure have been passed during the year and circulated to all heads of offices. The most important feature of these rules is the check imposed by them on the apprentice system which prevails in all Mofussil offices. By the orders of 1856, it was prescribed that no apprentice should be admitted into any office without the express sanction of the head of the office. It has been further prescribed by the rules now circulated that not more than five apprentices shall be retained in any office, and that apprentices failing to obtain a paid appointment within five years shall not be retained in any capacity.”

North Western Provinces.

316. In the North Western Provinces, also, the Education Department has till recently loudly complained of the disregard on the part of civil officers of the rules of 1856. In August 1864 the Government of the North Western Provinces order the submission annually by all heads of offices of a statement showing, among other things, the *place of education* of all persons appointed to Government situations. From these statements the following results were made out by the Director :

DEPARTMENTS.	1864.		1865.	
	Number of Appointments made.	Number of Persons Educated at Government Schools taken.	Number of Appointments made.	Number of Persons Educated at Government Schools taken.
Judicial - - - - -	14	2	12	1
Revenue - - - - -	45	15	38	13
Public Works - - - - -	15	15	4	4
Police - - - - -	13	6	3	1
Jail - - - - -	26	7	19	6
Education - - - - -	29	26	26	18
TOTAL - - -	142	71	102	48

From this the Director observes, “ it appears that in all departments, except public works and education, the preference is given to privately educated students.”

Punjab.

317. In his Report for 1863-64 the Director of Public Instruction, while admitting that the relatives of the native amlah, who had served as apprentices, are almost invariably nominated to fill vacancies, did not see his way to recommend more than that all such candidates should be required to show some knowledge in history, geography, and arithmetic. The Punjab Government, however, went further and passed during 1865-66 rules for the examination of candidates for tehsildarships, treasury and other clerkships, pleaderships, &c., due weight being given to success in the University examinations. It is stated, in the Report above alluded to, that the subject of an elementary examination of candidates for *subordinate* government employ is still under the consideration of a committee.

Madras.

318. In Madras a scheme of examination for all appointments above the grade of peon was promulgated in 1858, a copy of the rules and of the correspondence on the subject will be found in Appendix (F.) of the Education Report for 1858-59.

The enormous numbers who came up for examination, some of them being quite unfitted for it, gave rise to several modifications. A fee of 3-8 rupees was levied from each candidate; but it was found necessary afterwards to raise it to five rupees for the general test, and to seven rupees for the special test. The operation of the general test has further been restricted to situations above 25 rupees per mensem.

These examinations are termed the "Uncovenanted Civil Service Examinations, and are under the charge of a Special Commissioner.

Bombay.

319. In September 1866 the Bombay Government issued a notification which contains the present Rules for regulating the admission of candidates into the lower grades of the Public Service. These rules are given below:—

"The following Rules for regulating the admission of candidates into the lower grades of the Public Service are published in supercession of those issued in the *Government Gazette* of the 20th May 1852, and subsequently. The Rules apply to all appointments in the revenue, judicial, political, and other branches of the service above those of a menial character, and the salary of which is 50 rupees and under. The Rules do not apply to the executive police, or to persons nominated from the executive police to other offices in the same department. Special Rules already exist for admission to, and promotion in, the higher grades.

"I. Hereafter no one will be eligible for employment, except:—

"1st. Matriculated students of the University, who are admissible without further examination or certificate.

"2nd. The holders of certificates of qualification from the Educational Department.

"3rd. The holders of certificates issued by a committee held in past years under the old Rules.

"II. The certificates of qualification to be given by the Educational Department will be of two classes: a first class will certify that the candidate is qualified according to the standard specified in Appendix (A.), and will be a passport for admission into either English or vernacular offices.

"A second class certificate will qualify a candidate for admission into a vernacular office only, and will certify that he is qualified according to the standard specified in Appendix (B.)

"Certificates will be awarded in Government schools at the time of the annual inspection. First class certificates must be signed by Educational Inspectors; second class certificates by Deputy or Assistant Deputy Inspectors. Each first class certificate must bear the holder's signature in English characters, and each second class certificate must bear the holder's signature in vernacular characters.

"III. Candidates from schools not under Government inspection must, on or before the 1st October in each year, make application to the Educational Inspector of the Division, or to the nearest Deputy Educational Inspector, according as they wish, for first class or second class certificates. Arrangements will then be made for their examination.

"IV. The Director of Public Instruction will publish quarterly, in the *Government Gazette*, a list of the candidates passed under the respective standards. From this list the nominating officer will make his selection; and if it be found that the number of candidates passed according to the standards now prescribed is so small as not to allow a field for selection, Government, on report being made, will revise the standards of examination.

"V. Every one admitted into the Public Service, in the manner above described will enter, subject to the condition of passing an examination in the special subjects of which a knowledge is required in the Department.

"VI. The Rules for regulating the Departmental Examinations will be sanctioned by Government, from time to time, as may be deemed expedient.

"VII. No one is admissible into the Service under the age of 18; and no one, except a matriculated student of the University, will be eligible for promotion to a place of more than 30 rupees in the English, or 20 rupees in the Vernacular Departments, until the expiration of three years' service, unless the place to which he is nominated be the lowest paid in the office."

Oude.

320. There is no information as to the existence of any rules or system for regulating the admission of candidates for public employ in Oude.

Central Provinces.

321. In 1863 the Chief Commissioner of the Central Provinces issued orders requiring all candidates for subordinate public employ in which a certain degree of scholarship was essential, as well as all persons holding such situations, to be subjected to certain tests by examination before being employed, confirmed in employ, or promoted, as the case might be.

Two classes of certificates were arranged, the one for passing an elementary examination in reading, writing, and arithmetic; and the other for higher acquirements, including the knowledge of a second language, and acquaintance with geography, Indian history, and arithmetic up to decimal fractions.

Since the promulgation of the above rules, no less than 1,100 men have passed.

Mysore.

322. The following paragraph from the Director's Report of 1865-66 shows how matters stand in that Province :—

“ Nearly all the public servants have been educated either in the Government or Mysore schools; and, though a formal system of examination has not been established as in Madras, heads of offices have been requested to give the preference to educated candidates. Volunteers in offices who have not finished their education are no longer permitted, and the abolition of the practice has been attended with beneficial results to the schools.”

SECTION X.

ENGLISH LANGUAGE IN INDIAN EDUCATION.

323. The position of the English language in relation to the various grades of schools in India is a matter of some importance. In the Dispatch of 1854 the Home Government intimated an opinion that, for the conveyance of general education to the great mass of the people, the *vernacular* must necessarily be used as the *medium*, while, for the conveyance of a high order of education in the science and literature of Europe, it was equally necessary that the *English language* should be the *medium*. Reference was also made to the evil tendency, which had shown itself more especially in the immediate vicinity of the Presidency towns, to substitute a study of the English language in place of the acquisition of general knowledge through the vernacular.

Bengal.

324. The committee for the improvement of schools in *Bengal* seem to express an opinion in their Report of 1856, that even in the Government zillah schools some encouragement was given to this tendency. Many of the zillah schols, professing to afford a high order of education, and adopting English as the medium of conveying it, were, nevertheless, believed to be “ really inferior schools,” and for these the committee recommended a lower classification, and the adoption of the vernacular as the medium of instruction. But the direction in which the tendency was most observable in the committee's opinion was that of the grant-in-aid schools, a large class of which were the result of the growing desire for English education, and were fitted only to meet the wants of those who desired to obtain at a cheap rate, and without the inconvenience of absence from home, “ as much knowledge of English, and no more, as is sufficient for becoming inferior clerks, copyists, salesmen, hawkers, &c.”

325. The committee were “ unanimously of opinion that the tendency of such schools is to aggravate a very serious evil, viz., the substitution of a very imperfect and inaccurate knowledge of English, with a still smaller knowledge of other things for that higher education which, while giving full and accurate information of a practical kind, would at the same time strengthen the faculties of the mind.”

326. It was stated some years ago by the Director of Public Instruction, Bengal, that "to secure for their children a knowledge of our tongue is the one object for which, as a rule, the people are willing to pay, and for this they will frequently incur an expense which would even altogether be disproportioned to their means;" and this is doubtless still the case. It is clearly, therefore, necessary to watch lest this desire for the acquisition of English should lead to the result feared by the committee.

327. The Director of Public Instruction entered at length into the subject in his Report for 1863-64. He there stated that he did not entertain any apprehension of the study of English being carried on at the expense of a sound practical education conveyed through the medium of the vernacular. On the contrary, he thought that the introduction of English as a language to be studied had exactly the opposite effect, tending to raise the standard of a school by introducing the laborious study of the grammar of a non-vernacular language, and thereby supplying to Indian schools what the study of the Latin grammar supplies to English schools, viz., a study which trains and disciplines the mind.

328. But Mr. Atkinson admitted that "in many Anglo-vernacular schools, English is far too much employed as the medium of instruction, and this to such an extent as seriously to retard the progress of the students in their acquisition of general knowledge; while, as regards quality, the English taught in them is too often not only rudimentary, but curiously faulty in idiom and accent." Mr. Atkinson thus admitted the main point to which the committee's observations were directed. But while making this admission, he seems, if I understand his remarks rightly, to contend that the evils of a too large use of the English language as a medium of instruction are less than the advantages. The great money value attached by the natives of Bengal to an acquisition of the English language led, he observed, to an easy obtainment of funds, which would otherwise be wanting, thus indirectly improving the staff and status of the schools; and, on the whole, he was of opinion that the use made of the English language, "though not free from mistakes and disadvantages," was beneficial, and deserved "encouragement rather than repression."

North-Western Provinces.

329. In the North-Western Provinces there were until recently but few schools in which English was taught as a language, much less used as the medium of instruction.

330. The education reports of the North-Western Provinces for the last few years contain notices of the rapidly extending desire among the people for the acquisition of a knowledge of the English language, but as yet apparently it is chiefly taught as a language, and not made to supersede the vernacular as a medium of instruction. In 1863-64 the Director estimated the number of pupils studying English as "three or four times what it was in 1856," and stated that Anglo-vernacular schools or classes had been started at almost every chief town. In the Report for 1865-66 he records a still further development of the desire for the study of English, stating that he reckons the number of students of English in Government schools to be about 6,500, and in aided schools about 9,229, being about half as much again as the estimate of the previous year.

Punjab.

331. In the Punjab also, the study of the English language has been of comparatively recent growth, and every year's returns show how rapidly it is increasing. The following figures give some idea of the increase:—

	Number of Pupils studying English at Government and Private Schools.
1861-62 - - - - -	4,439
1862-63 - - - - -	5,834
1863-64 - - - - -	8,359
1864-65 - - - - -	11,269
1865-66 - - - - -	13,181

332. The increase is almost entirely in schools of the higher class. There is nothing in the Punjab reports to show how far instruction is conveyed through the *medium of English*, but it is probable that the bulk of those entered in the statement above are studying English merely as a language. It was distinctly stated by the Director, in 1863-64, that the neglect of vernacular studies, for the purpose of learning English, had been "specially prohibited," and that the attention of district and educational officers had been "repeatedly directed to the prevention of this evil."

Madras.

333. In Madras the question of the relative position of English and the vernacular in the school system was some years ago made the subject of full discussion. The discussion is fully reported in Appendix (A.) of the Report for 1860-61. The following account of it was given in the body of the Report for that year :—

"The other question had reference to the relations of the English and vernacular languages in our system of instruction. Sir Charles Trevelyan was of opinion that of late years an undue preference had been given to vernacular instruction to the prejudice of English instruction, and that the rule under which in the lower classes of the provincial and zillah schools, and throughout the talook schools 'geography and such like science is taught from vernacular books, and the explanations are ordered to be given in the vernacular language,' ought to be annulled. Mr. Powell, the acting director, expressed similar views, and he pronounced an unfavourable opinion on the talook schools. He recommended that the number of these schools should be reduced, their designation altered, and that those retained should be raised to the standard of Anglo-vernacular zillah schools. Mr. Arbuthnot, to whom the entire question was referred on his return from England, deprecated any radical changes in the existing system. He repeated the arguments previously urged by him in support of his opinion, that the vernacular languages should be largely made use of in schools of all grades; and that in the talook schools, and in the lower classes of the provincial and zillah schools, the whole of the substantive instruction given should be imparted through their medium.

* * * * *

"He did not overlook the fact that the English language, which in most Indian schools takes the place which is occupied by the Greek and Latin languages in the schools and colleges of Europe, being a spoken language, and as the language of the Government being largely used in the transaction of business, has practical claims in this country, which cannot be asserted in Europe in favour of the ancient language of Greece and Rome; and on this ground, he would teach it as a language in all schools 'for which it is possible to obtain masters at all competent to teach it;' but he would not 'place it as a barrier against the acquisition of much that is likely to prove useful to those who, either from inaptitude for mastering a difficult foreign language, or from want of time, are unable to obtain that mastery over it which is essential to the acquirement of accurate knowledge through its medium, by constituting it the language of instruction in all subjects except the vernacular language."

334. The following remarks on the subject are taken from the Madras Report of 1863-64 :

Para. 315. "The positions formerly occupied by the English language and the vernacular of the Presidency remain unaltered in the Government system of education. In talook schools and in the lower classes of zillah schools, English is taught merely as a language, substantive knowledge being conveyed through the medium of the vernaculars. It is to be observed that there is an increasing demand for English, so that, even in village schools, efforts are frequently made to introduce the study of that language. This appetite for English, though in most respects affording ground for congratulation, has, in several instances, led to an attempt to convey substantive instruction through that language, before the pupils possessed a sufficient grasp of it; the result, as may be gathered from notices in previous portions of this report, has always been a failure more or less complete. It is evident indeed, without falling back upon experience, that the course is most unsound, and cannot but be highly injurious to the pupils."

The English language in Indian education.

Bombay.

335. In Bombay perhaps, more than anywhere else in India, the Government has upheld the principle of giving a through practical education through the medium

medium of the vernacular. The Report of 1859-60 contained the following remark :—

“ The educational system of the Presidency is remarkable for the great development of vernacular compared with Anglo-vernacular and English teaching. *English education* has, in fact, been starved in the interest of vernacular education.”

336. In the more recent operations of the Bombay Education Department, higher class Anglo-vernacular and English education has received its full share of attention, as will be seen from the remarks and statistics submitted in previous sections of this note with reference to colleges and higher as well as middle class schools.

337. In his Report of 1863-64 the Director made the following remarks on the subject :—

“ The increased desire for a knowledge of English manifests itself in the constant applications from the people for schoolmasters able to teach English. With this object special subscriptions are raised by the people; and though, no doubt their only object in seeking a knowledge of English for their sons and relatives is to fit them for Government and other employ, yet it can hardly be expected, in the present state of education, that they should have any higher or ulterior object.”

Oude.

338. In Oude about 26 per cent. of the whole number of pupils are entered in the returns as studying “English.” In a report submitted in 1865 the following principles were indicated as those by which the study of English was regulated in Anglo-vernacular schools :—

(1.) “ That no pupil should begin English till he has made a certain degree of progress in learning to read and write the vernacular.

(2.) “ That whilst learning English as a language each pupil should be grounded in the elements of European knowledge through the medium of Oordoo or Hindee.

(3.) “ That only in the upper classes should English preponderate over the vernacular, and become the medium for imparting instruction in science.”

Central Provinces.

339. As respects English education in the schools of the Central Provinces, the Director made the following remarks in his Report of 1863-64 :—

“ It is generally admitted that whilst the English language should not be the sole or chief medium of instruction given to the natives of India, yet that western knowledge must be the chief matter of instruction. In those provinces wherever a desire for instruction in English has existed, such instruction has been afforded. Vernacular education, on the other hand, has not been neglected, and means have been taken by the introduction into our vernacular schools of books of general and special knowledge to render that education as complete as possible.

“ The students of English are required to pay a higher fee than merely vernacular scholars. By this means an attempt has been made to limit instruction in English to the sons of those who are able to allow their children to remain at school for the time requisite to obtain a grammatical and practical knowledge of the English language.”

The following table shows the increase in the number of pupils studying English in the Central Provinces :

									Number.
1863-64 -	-	-	-	-	-	-	-	-	1,207
1864-65 -	-	-	-	-	-	-	-	-	1,235
1865-66 -	-	-	-	-	-	-	-	-	1,526

Mysore.

340. The Director reports on this subject, that although a knowledge of English is sought by the upper classes of native society as a means of qualifying them for Government employment, but, at a distance from the large towns, there are comparatively few who desire to learn English.

SECTION XI.

BOOK DEPARTMENTS.

341. The publication, distribution and sale of educational books form a not unimportant portion of the educational system.

Bengal.

342. The following extract from the Bengal Report for 1863-64 gives an account of the system adopted in that Province :—

“ SCHOOL BOOK AND VERNACULAR LITERATURE SOCIETY.—There is no direct Government agency in Bengal for the preparation and distribution of educational books, but the object is effected through the instrumentality of the school book and Vernacular Literature Society, an educational institution conducted by a committee of gentlemen associated for the purpose of providing and disseminating through the country a supply of suitable school books and school apparatus, together with wholesome vernacular publications for general reading, as a means of advancing the education of the people. The society receives a grant in aid of 650 rupees a month, from Government, 500 rupees being assigned to the school book department, and 150 rupees to the department of vernacular literature. To facilitate the distribution of books and apparatus, numerous country agencies are established throughout the Lower Provinces. These are chiefly entrusted to masters in Government schools and the deputy school inspectors, who receive a commission of 10 per cent. upon all sales. The report of the society for 1863 shows that it employed in that year 63 country agents, and that the proceeds of the sales effected by them, after deducting commission and other expenses, amounted to 16,718 rupees.”

343. The following extract from the Report of 1865-66 brings the account of these operations up to date :—

“ SCHOOL BOOKS.—The last report of the School Book Society for the year ending 31 December 1865 shows a steady increase in the demand for books and apparatus. The amount realised by sale in the last three years have been 42,493 rupees in 1863, 54,577 rupees in 1864, and 64,317 rupees in 1865. The number of books issued in these years were respectively 139,370 copies, 169,418 copies, and 184,043 copies. The following abstract shows the languages of the books issued in 1864-65 :—

BOOKS.	COPIES.	
	1864.	1865.
English - - - - -	70,641	68,525
Sanscrit - - - - -	1,409	2,068
Bengalee - - - - -	76,582	83,588
Hindee - - - - -	5,616	3,890
Ooriya - - - - -	5,922	12,824
Santhali - - - - -	10	3
Cossyah - - - - -	1,322	511
Arabic - - - - -	21	29
Persian - - - - -	136	71
Oordoo - - - - -	3,930	2,683
Anglo-Asiatic - - - - -	3,829	9,851
TOTAL - - -	169,418	184,043

North Western Provinces.

344. In the *North Western Provinces* there is a Government curator and book depôt at head quarters. There were also, until recently, a regular book-selling agency and book depôts maintained throughout the country; but these have been abolished, and the sale of books in the interior has been intrusted to the officers of the department, who are allowed a commission on all sales effected. The following account of the system is given in the Report for 1861-62 :—

“ These sales are more directly in the hands of the deputy inspectors, who indent on the Allahabad Depôt for such books as may be required in their respective districts. A large discount is allowed by Government for cash purchases, and a commission

commission on sales to a certain amount is granted to the deputy inspector, it being the object of Government to effect quick and ready sales at the lowest possible price. Some of the school books issued are marvels of neatness and cheapness, and the successive editions of the more necessary treatises are exhausted with great rapidity."

345. In 1863-64 the sales of educational books in the North Western Provinces from the central dépôt amounted to 50,415 rupees. In the next year 1864-65 they amounted to 28,181 rupees, and in 1865-66 to 27,782 rupees. The number of copies of works sold in 1864-65 was 185,470, and in 1865-66 it was 187,230. The books are printed and published on the recommendation of the education authorities.

Punjab.

346. The following extract from the Punjab Report for 1863-64 shows the nature of the arrangement made in that Province for the distribution and sale of educational works.

"The Government Central Book Dépôt at Lahore has been hitherto conducted as a commercial business, for the working of which advances up to 40,000 rupees altogether were authorised; but only 28,500 rupees were actually taken from the treasury. To cover packing, transit, and other charges, first 30 and afterwards 50 per cent. was added to the cost price to form the selling price. The curator, with a small establishment at Lahore, is paid from Imperial revenue, and the retail work is carried on by the district school mohurirs, head masters of Government schools, and librarians of Government colleges, with an occasional private agent who will give sufficient security. A commission of 10 per cent. is allowed on all retail sales. The value of cash and stock in hand at the close of April 1864 amounts to 50,372 rupees, calculated at cost price. The profits of the dépôt, therefore, since its formation in 1857 have been 21,872 rupees.

"78.—From the beginning of the current year, viz., 1st May 1864, I have been directed to adopt another plan. The advances already made are to be written off to begin with, and all cash in hand on the above date is to be paid into the treasury. Then monthly bills for stock purchased are to be sent for audit to the civil paymaster, and the sale proceeds paid monthly into the treasury; disbursements and receipts to the above extent being for the future duly provided for in the Educational Budget. Provision has also been made in the Budget, and sanctioned by the Supreme Government, for meeting all packing, transit, and commission charges out of Imperial revenue, in order that all books may henceforward be sold for educational purposes at cost price without any enhancement whatever. This will be a great boon to all kinds of educational institutions, and especially to Government and aided colleges and schools of the zillah grade, where comparatively expensive English books must be purchased by the scholars."

347. The following statement shows the issues of books in the Punjab for the last three years:—

	NUMBER OF COPIES.			VALUE.		
	Distributed gratuitously to Government Village.			Distributed gratuitously to Government Village.		
	Sold.	Schools.	Prizes.	Sold.	Schools.	Prizes.
				<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
1863-64 - - -	55,499	2,730	7,032	16,690	2,634	3,520
1864-65 - - -	101,168	3,677	5,114	24,956	1,570	3,115
1865-66 - - -	98,854	1,238	8,892	26,225	795	3,775

Madras.

348. The following extract from the Madras Report of 1863-64 shows the nature of the arrangements made in that Presidency for the sale and distribution of educational books:—

"The purchase and circulation of books in connection with the department of public instruction are managed in the following manner:—A central book dépôt exists

exists at Madras under an officer styled the curator of Government books; and 20 district book depôts are established at the principal stations in the Mofussil, in the charge of officers termed district curators. The curator of Government books receives a salary of 200 rupees per mensem, and is allowed an establishment costing 179 rupees per mensem. The district curators, who are almost all either masters in Government schools, missionaries, or members of trading firms, are remunerated by a commission of 10 per cent. on the sales effected by them.

* * * * *

“The central depôt is supplied in three ways:—(1) by purchases in England through Messrs. Smith, Elder and Company, who deliver the books free of insurance, freight and other charges at Madras at a discount of $17\frac{1}{2}$ per cent. below the English prices; (2) by purchases made in India by the curator of Government books; and (3) by the receipt of works printed either at the public instruction press, or at some private press engaged for the purpose. In every case the supply is previously sanctioned by the Director of Public Instruction. Books are forwarded to the district depôts on indents transmitted to the Director of Public Instruction through the inspectors of the division.

“In certain districts, Coimbatore, for example, where an attempt is being made to improve the indigenous schools, colporteurs are employed to travel about and effect sales of elementary works at the several schools.”

349. The following statement shows the number and value of educational books sold during the last three years:—

	Number Sold.	Value.
		<i>Rs.</i>
1863-64 - - - - -	76,438	33,661
1864-65 - - - - -	76,521	29,372
1865-66 - - - - -	76,533	31,206

Bombay.

350. In the Bombay Presidency the book department consists of a central depôt at Bombay with principal branches at Ahmedabad and Belgaum, and a large number of minor branches (581 in 1863-64). The branches are generally held in Government schools, the schoolmasters acting as branch depôt-keepers, and getting a sale commission.

351. The Bombay book department is more than self-supporting. The number and value of books sold or issued for sale from the central depôt for the last two years is given below:—

	Number.	Value.
		<i>Rs.</i>
1864-65 - - - - -	265,643	89,479
1865-66 - - - - -	351,857	1,15,714

Oude.

352. The book department in Oude was re-organised in 1865 on the following basis:—

- 1.—A central depôt attached to the Director's office.
- 2.—A branch depôt in each district, under the charge of the head master of the zillah school, who receives a commission of 10 per cent. on sales.
- 3.—Books, maps, &c., for school use, are forwarded from the central depôt only.
- 4.—Books are sold to pupils and managers of private schools at cost price; all extra expenses for packing, freight, &c., being charged to Government.

353. The following figures show the number and value of the books issued in the last two years :—

						Supplied Gratis.		Sold.
						For School Use.	Prizes.	
1864-65	-	-	-	-	-	732	817	16,294
	-	-	-	-	-	Rs. 1,153	165	2,521
1865-66	-	-	-	-	-	3,325	3,077	32,520
	-	-	-	-	-	Rs. 1,423	537	4,988

Central Provinces.

354. The following account of the book department in the Central Provinces is taken from a Report submitted in 1864 :—

“There are three dépôts in these Provinces; they are established at Nagpore, Raepore, and Jubbulpore. Their operations are commercial as well as educational. Books are purchased for the dépôts on which a discount for cash payment, at 20 or 15 rupees per cent. is allowed. These books are again retailed, and a discount of only 10 per cent. is granted for cash payment; thus a small per-centage is allowed to accumulate as profit, and from this fund, money that has been advanced for the purchase of books, is repaid to the State.”

355. The number and value of educational books sold in the Central Provinces during the last three years, is shown below :—

						Number.	Value.
							Rs.
1863-64	-	-	-	-	-	57,408	11,899
1864-65	-	-	-	-	-	54,999	13,861
1865-66	-	-	-	-	-	66,435	16,578

Mysore.

356. The following account of the book department in Mysore, was given in the Report for 1863-64 :—

“This department was formerly constituted, as in the Punjab, on a *quasi* commercial basis, its working capital being advanced by Government; but it is now conducted by an annual grant for the purpose, the sale proceeds being paid into the local treasuries, and a monthly account of cash transactions and stock on hand submitted to the auditor. Most of the vernacular books, and many of the English ones, have been printed at the Mysore Government press, and are in all cases sold at a price to cover the cost of production.

“As a further means of increasing their circulation, it has lately been determined to form depositories in every talook under the care of the Amildars, and to allow a discount to all who purchase them in any quantity for sale in the towns and villages of each talook.”

357. Consequent on the measure reported above, the sales increased so much, that it was found necessary in 1864-65, to appoint a curator. The supply of vernacular books are mainly required for the indigenous schools of the country, numbering about 1,600.

Again, during 1865-66, the sales were reported to have nearly doubled; but no account of sales is given in the Director's Reports.

British Burmah.

358. There is no regular book department in British Burmah, but efforts have of late been made to provide a supply of vernacular books for the indigenous schools of the country. Some of these books have had to be compiled for the purpose, for which a grant was sanctioned by the Government.

SECTION XII.

GRANT-IN-AID RULES.

359. There are two distinct sets of Rules for Grants-in-Aid, viz. :—

(1.) Ordinary Grant-in-Aid Rules, *i. e.*, the Rules under which in each Presidency and Province Grants-in-Aid are ordinarily given to private schools. Of these, there is a different set of Rules for each Presidency or Province.

(2.) Special Grant-in-Aid Rules for schools designed for the instruction of European and Eurasian children. These are generally known as the Rules contained in “Lord Canning’s Minute of October 1860;” they were approved and confirmed by the Secretary of State in Despatch No. 3, dated the 16th January 1861.

The former, viz., the ordinary Grant-in-Aid Rules for each Presidency and Province, will be found in Appendix (A).

The latter will be found in Appendix (B).

360. It will be observed that the Rules for the Provinces, noted on the margin, provide for the grant of fixed allowances to aided institutions, under conditions which are substantially the same, and subject to the same general limitation of the amount of aid to an equivalent of the local income or half the total expenditure. But the Bengal Code provides further that, as a general rule, schools educating up to the university entrance standard shall get only a half equivalent of the local income; and that schools of an inferior grade, but costing more than 30 rupees per mensem, shall get a two-thirds equivalent; the only schools to which the full equivalent will ordinarily be given being those costing less than 30 rupees per mensem. The adoption of this scale in Bengal is regarded as justified, in respect of the schools to which it applies, by the greater advance which education has made in Bengal than in other Provinces, and by the greater willingness of the people of Bengal to pay for education than is found as yet to exist generally in other parts of the country.

Bengal.
North Western
Provinces.
Punjab.
Oude.
British Burmah.

361. In the Central Provinces the Rules described above, in respect of the North Western Provinces, Punjab, &c., are substantially adopted, so far as they relate to schools for general education. Special Rules (Part B.) are added for normal institutions on the principle of paying, not a fixed allowance to the institution, but a stipend of four rupees per mensem to each student, signing a declaration of *bond fide* intention to follow the profession of a schoolmaster, and agreeing to refund the amount so received if he does not do so; lump payments of 100 rupees, 50 rupees, or 25 rupees being also promised to every student qualified respectively as an Anglo-vernacular zillah school teacher, a town school teacher, or a village school teacher. Special Rules (Part C.) are also given for regulating grants-in-aid to indigenous village schools, on the principle of payment by results; the teacher receiving one, two, three, or four annas per mensem for pupils passing the prescribed examinations (and double those rates for female pupils), subject, of course, to conditions in respect of the age of pupils, periods for which the allowances may be drawn, &c.

Central Provinces.

362. The main feature of the Madras Rules is the “Teacher Certificate System;” but it is only a main feature, as will be seen from the following brief analysis of the scheme :—

Madras.

I.—PUPIL GRANTS.

It is open to managers of schools, who desire to obtain grants on the results of periodical examinations of the pupils, to submit their schools to examination according

ing to the standards in Schedule (A.), and to obtain grants according to the rates in Schedule (B.), as follows:—

European and Eurasian Schools.

				Hill Schools.	Schools in the Plains.
				Rs.	Rs.
To each pupil passed under	1st Standard -	-	-	4 per mensem -	2 per mensem.
	2nd „ -	-	-	8 „ -	5 „
	3rd „ -	-	-	12 „ -	10 „
<i>Native Schools :</i>					
To each pupil passed under	1st Standard -	-	-	2 „ -	—
	2nd „ -	-	-	5 „ -	—
	3rd „ -	-	-	10 „ -	—

The above provisions are intended primarily for elementary schools, to which the amount of grant obtainable practically limits their application.

II.—TEACHER GRANTS.

Certificate Holders.

MALE TEACHERS.			Female Teachers.
1st Grade—B. A. standard	-	-	1st Grade—(Standard, as per Schedule (D).
			Entitling to such grant, not exceeding the amount contributed by the manager of the school, as the Director of Public Instruction, with the sanction of Government, may determine.
2nd Grade—1st Arts standard	-	Rs. 75	25, 2nd Grade—(Standard, as per Schedule (D).
3rd Grade—Matriculation standard	-	50	10, 3rd Grade—(Standard, as per Schedule (D).
4th Grade—(standard as per Schedule (C.), 25	-	25	
5th Grade—Ditto	-	10	
			Entitling to the grants noted, provided the amount of grant shall not exceed the amount contributed by the managers

Not Holding Certificates.

A grant not exceeding *one-half* of the sum contributed by the manager of the schools will be given in aid of the salary of each schoolmaster or schoolmistress, in regard to whom the managers may satisfy the Director of Public Instruction that the said teacher is fairly qualified to perform the duties entrusted to him or her, provided that in such cases the amount of the grant to be given shall bear a due proportion to the amounts sanctioned (as above) for teachers holding certificates.

III.—MISCELLANEOUS GRANTS.

Payment of normal and certain other scholarships.

Provision of books of reference, maps, &c.; and in some cases of school books.

Establishment and maintenance of school libraries and public libraries.

Erection, purchase, enlargement, or repair of school buildings.

Provision of school furniture.

The above grants are all made under special detailed conditions, but are all subject to the general principle that the amounts shall not exceed the sum contributed by the manager.

363. The Madras Education Act practically provides another system of grants-in-aid for the elementary “Rate Schools” established thereunder, for the Government gives an equivalent to all sums made available for the establishment of schools under that Act.

364. The Bombay Rules are, as will be observed, provisional, the period for which they are to be in force being limited to two years from February 1866, being then “subject to revision as experience may show to be needed.”

365. The principle of the Bombay Rules is that of “payment by results,” *i. e.*, payment at specified rates for pupils passing according to the general standards.

standards. The annual grants obtainable for each pupil passing under all the heads of the general standards are as follows :—

	1st Standard.	2nd Standard.	3rd Standard.	4th Standard.	5th Standard.	6th Standard.
	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
Pupils of—						
European and Eurasian Schools.	10	15	25	50	90	150
Anglo - Vernacular Schools.	6	9	12	21	30	100
Vernacular Schools -	1	2	3	4	—	—

366. The Special Rules for European and Eurasian schools contained in Lord Canning's Minute of October 1860 provide generally for the following grants :—

(1.) That to the sum collected from private subscriptions as a building and foundation fund, an equal sum be added by the Government.

(2.) That from the opening of each school it should receive a grant-in-aid to the fullest extent allowed by the (ordinary) rules.

(3.) That if the school be built where ground is at the disposal of Government, the ground be given.

(4.) That the head master of the school, if the clergyman, be placed on the footing of Government chaplain in regard to pension.

367. A few remarks on general points connected with the grant-in-aid system may not be out of place.

368. In January 1864 the Government allowed schooling fees to be counted as part of the local income by which the amount of the Government grant-in-aid is regulated. This was a very important concession. In respect of assignments from municipal revenue or educational cesses, the following orders were passed in 1865 :—

“ The fundamental principle of the educational grant-in-aid system being to encourage and stimulate voluntary efforts on the part of the people towards the promotion of education, there appears to be no reason why popular contributions, in the form of assignments from municipal revenue or educational cesses should not be regarded as eligible to such encouragement under the Grant-in-aid Rules so long as the contributions in question are really of a voluntary character. But, on the other hand, it would seem to involve a departure from the principle and intention of the grant-in-aid system if grants are made as supplements to funds not voluntarily subscribed, or made available by the people, but compulsorily levied. The fact that a certain portion of the land revenue, for instance, is set apart for local objects, does not afford any ground for regarding it in the light of a contribution which may be supplemented by a grant under the Educational Grant-in-aid Rules.

“ It has been decided that the proceeds of cesses realised under the Madras Education Act (VI. of 1863) may be supplemented by grants-in-aid from the general revenues, because the assessment under that Act is an essentially voluntary one.”

Resolution No.
2,295, dated 8 April
1863.

369. Many of the municipal assignments in Bombay come under this ruling, as well as the voluntary assessment for educational purposes made by the landowners in some permanently settled districts in the North Western Provinces.

370. A considerable amount of correspondence has taken place within the last few years respecting the practical working of the grant-in-aid rules in the several Presidencies and Provinces.

371. Although objections have been strongly urged in some quarters against the Bengal Rules, in the case of missionary societies undertaking educational operations, the general conclusion arrived at by the Government of India and concurred in by the Secretary of State, is that the Bengal Rules are “ well adapted to the wants of the country, and do not call at present for “ any alteration.” It may be noted, however, that one objection urged against the Bengal

Code gave rise to a modification of practice, as shown in the following extracts from correspondence :—

EXTRACT from Letter from the Government of India to the Government of Bengal, No. 2977, dated 18th October 1866.

Para. 2. "In paragraphs 17 and 18 of his letter, Mr. Stuart is understood to complain of the objection taken by the Bengal Education Department to a re-distribution of the sources from which the private income of an aided school is derived, his wish being apparently that the managers of a school to which a Government grant has been originally assigned, in consideration of a guaranteed private income derived in specified proportions from 'schooling fees' and 'subscriptions,' should be allowed, in the event of the income from 'fees' increasing, to withdraw a proportionate amount of the 'subscriptions,' provided that the *total* amount of income guaranteed from private sources be maintained.

3. "It is not quite clear, from Mr. Atkinson's remarks (paragraphs 51 to 55 of his note) how far the above view is conceded. Mr. Atkinson says that, 'When a school receives a grant under the revised rules, the guarantee required is that a certain sum at least shall be expended on it from subscriptions and fees together,' adding, 'that no fixed payment is guaranteed from subscriptions alone, and if the fees are sufficient to make up the specified sum, no subscriptions need be paid.' But the 52nd paragraph of Mr. Atkinson's Memorandum would seem to imply that the application of this principle is restricted to 'new schools' as distinguished from 'those already in operation,' and that the 'withdrawal of subscriptions' from the latter class of schools is not allowed. If this is a correct statement of Mr. Atkinson's meaning, it will apparently follow that, wherever 'subscriptions' have been once paid as part of the private income of a school, no subsequent withdrawal of such subscriptions can be allowed, however much the fee receipts may increase; although no objection would, in the first instance, have been raised had the private income been composed wholly of fee receipts. If this is the rule which is at present in operation in Bengal, the Governor General in Council would ask the Lieutenant Governor's further consideration of the subject, for it may be doubted whether such a restriction is not calculated to interfere with what may be a very proper re-distribution of private resources. It is seldom that a newly established school, especially if it be a vernacular school, in a part of the country where education has not come to be appreciated by the people, can produce, in the early part of its existence, much income from fees; and there must, of course, therefore at first be a correspondingly large share of subscriptions to make up the required amount of private income; but as the school gains footing among the people, the fee income will ordinarily increase, and in that case it does not seem to the Governor General in Council to be an unreasonable expectation that the increase of fee receipts should be allowed to take the place of the subscriptions previously given; and such an expectation is certainly not less reasonable if the subscriptions form a part of a limited income, the whole of which is sought to be expended on the advancement of education; and if the object in withdrawing assistance from one school which has attained a state in which it is, to a large extent, self-supporting, is to afford it to some new school which could not be established, or carried through the first period of its existence without such aid."

EXTRACT from Letter from Government of Bengal to Government of India, No. 1,353, dated 6th March 1866.

Para. 2. "I am to say that, practically, retrospective effect has been given to the rule (allowing of a re-distribution of the sources of income of a grant-in-aid school), and that now the Lieutenant Governor has no objection to direct authoritatively that this course shall be followed."

EATRACT from Letter from Government of India to Government of Bengal.

Para. 2. "The Governor General in Council, I am to say, fully approves of the intention expressed in your letter dated the 6th March, respecting the rule relating to the redistribution of the sources of income of schools receiving grants-in-aid, and he trusts that the fullest effect will be given to it."

372. Objections have also been urged against the Madras Rules, but they relate rather to the former than to the present rules. The following extract from a Despatch from the Secretary of State, dated 9th March 1866, will show the particular points respecting which doubts are still felt :—

"I observe that, in the revised rules which have been sanctioned for the Madras Presidency, the 'certificate system,' or that by which grants are made to certificated teachers, proportioned in amount to the examination which they may pass, is still retained as the 'leading feature' of the scheme; and as regards schools generally, there-

fore

fore, the rules are still open to the objection which was formerly stated to them, viz., 'that they tend to raise to an unnecessarily high scale the salaries of the masters, and, by requiring a large proportion of such increased salaries to be paid by the promoters of the school, impose on them a charge beyond the necessities of the case.' The hardship would be varied, but not diminished, should the managers of the school be unwilling or unable to raise the salary of a master who has successfully passed his examination to an amount equal to that of the grant to which his success in the examination would entitle him; for, in that case, the Government grant would not be paid in full, but be limited to the amount of salary paid by the managers, who would be unable to claim the balance of the grant as a contribution towards the general expenses of the school.

"Among the changes introduced by the new rules, it is now provided: 1st, that a grant, on a reduced scale, may be given in aid of the salary of any masters or mistresses of whose qualifications to perform their duties in a fairly efficient manner the Director of Public Instruction may be satisfied, though they may be unable to pass the certificate examination; and 2ndly, that in the case of elementary schools, the managers may have the option of obtaining grants according to the results of periodical examinations of the pupils. These provisions will materially mitigate the stringency of the rules as they formerly stood; and, though I am not altogether satisfied that the rules even now are not unduly directed to the raising of the standard of education in existing schools, while they fail to afford sufficient encouragement to the establishment of new ones, I shall not urge any further alteration of the rules in this respect till the amendments which have been sanctioned shall have had a fair trial."

373. The following remarks regarding the working of the grant-in-aid rules were made by the Madras Government in reviewing the report of 1865-66:—

"The working of the grant-in-aid rules, issued in January 1865, may be regarded as tolerably satisfactory. The number of aided schools rose during the year under review from 502, with an attendance of 22,351 pupils, to 876, with an attendance of 27,351 pupils, and the amount disbursed in grants-in-aid of the current expenses of the schools (chiefly in aid of the salaries of the teachers) from 89,802 rupees to Rs. 1,16,876. 4. 8. These figures, however, include the indigenous village schools in the districts of Vizagapatam, Nellore, North Arcot, Coimbatore, and Madura, numbering 498, with an attendance of 8,493 pupils, which received grants, amounting to Rs. 3,777. 12., on the 'payment for results' system, which, though similar in principle, is not identical in detail with the system provided for in rule 4 of the grant-in-aid-rules. Since the close of the year sanction has been granted for the extension of this system to every district in the Presidency, and the Director of Public Instruction has been requested so to re-cast the schedules appended to the grant-in-aid rules as to make them applicable to indigenous schools.

"It would appear from the reports from some of the leading managers of schools, of which the purport is given in the 70th and following paragraphs of the Director's letter, that the late revision of the grant-in-aid rules has resulted in effecting a considerable improvement in many of the existing schools, but that it has not contributed as much as might have been expected to the establishment of additional schools. This result is, doubtless, to be traced to the comparative inefficiency or inadequacy of the agency previously employed, and which induced the managers of schools to apply such aid as they could obtain from the State to strengthening the establishments of schools already in operation, in preference to organising new schools. But there is nothing in the rules, as they now stand, which can be said to impose undue checks on the extension of education, or to render the grant-in-aid system less applicable to elementary schools than to schools of a more advanced grade. The latter is a point on which considerable misconception appears to exist. The only inspectors who, in the reports now before Government, have expressed any opinions on the success, or otherwise, of the grant-in-aid system as now administered are Mr. Bowers and Mr. Marden. The former, contrasting its working with that of the Madras Education Act, remarks that, 'as now administered, in connection with educational certificates,' the grant-in-aid system has 'the advantage of greater simplicity, and is proving the more effectual instrument of popular education, chiefly through the medium of middle-class schools.' Mr. Bowers states that 'teachers who have obtained certificates are fast replacing those who have not,' and he observes that, 'although in individual instances it will sometimes be found that an uncertificated teacher is much superior to certificated teachers of the same grade, in the majority of cases the benefit of the rule which exacts some certificate of qualifications will be apparent.' Mr. Marden, while admitting that the present rules have 'somewhat stimulated education,' does not look 'for any rapid extension of education under the present arrangements,' and advocates the abolition of that part of the present system which makes the grants dependent on the certificates held by the teachers, and the substitution for it of a system of payment for results under rules better adapted to the requirements of elementary native schools than those now in force. The Government see nothing in the reports before them that

would justify so radical an alteration of the existing rules. In the discussions which took place regarding the grant-in-aid system in 1864, and in which several of the leading educational authorities in this Presidency took a part, there was a considerable preponderance of opinion in favour of the maintenance of a certificate system, and against the feasibility of carrying out effectively and on an extensive scale the system of payment for results. The Government, on full consideration, determined not to abandon the certificate system, but at the same time embodied in the rules a provision which it was hoped would afford to such managers of schools, as might prefer the 'payment for results' system, the means of obtaining aid in that form. It has lately been brought to the notice of Government that the standards of examination in arithmetic prescribed for native schools seeking aid under the latter system are too high, and that the scale of grants offered is too low. The first objection has been met by a reduction of the standard, and the Director of Public Instruction has been directed further to revise the schedules in such manner as he may deem best calculated to promote the successful working of the system. It remains to be seen which of the two systems of grant-in-aid will be found the more effective, viz., 1st, that of making monthly payments in aid of the salaries of teachers who have afforded evidence of their qualifications; or, 2nd, that of making grants on the results of periodical examinations of the pupils; but, in the meantime, it is the desire and intention of the Governor in Council that each of these two systems shall have a full and fair trial; and he trusts that, under their operation, considerable progress will be made in the extension, as well as in the improvement, of education in this Presidency in the course of the next few years. Much, of course, must depend on the exertions of the leading educational societies, and of private persons interested in the cause; but much may be effected by the judicious efforts of the inspectors of schools, whose duties should embrace, not only the inspection of those schools which are placed under Government inspection, but the promotion generally of all such measures as have for their object the improvement and extension of education in the districts under their charge."

374. As respects Bombay, the following extract from Mr. Howard's memorandum of June 1865, gives some idea of the history of the grant-in-aid system in that Presidency:—

"In this Presidency of Bombay there has been less done by private persons in the way of education, particularly superior education, than in some other parts of India. The people prefer State schools where they can get them. A code of rules, under which money might be granted to private schools, was published in January 1856, but the conditions were found to be too severe; and I prepared a less exacting draft, which was submitted to the Local Government in April 1857. The draft was forwarded to the Supreme Government, who, in June 1858, recommended in preference the rules in force in Bengal. These were accordingly notified in the "Government Gazette" of the 8th of July 1858. Not a single application for a grant under this code was registered. Doubtless it was notorious that, until lately, the Government had no funds wherewith to meet any such application. When, however, it seemed likely that fresh funds would be granted to education (1862), I took up the subject again, and proposed to adopt the principle of 'payment by results,' lately introduced by the Educational Committee of the Privy Council in England. The Local Government assenting, a set of provisional revised rules were issued in November 1863. Grants have been made under these rules; but, in deference to a complaint of some missionary bodies that the scale of payments was too low, they did not object to the principle of payment by results; the Government directed a revision of the code, which took place last year. A new draft code has been prepared, but is not yet sanctioned. There has been some misunderstanding on this subject, which the simple facts above given should remove."

375. The following extract from the Bombay Education Report for 1865-66, shows the hope entertained by the Director of the working of the new rules:—

"The year under report shows no change in the number of private institutions that have actually received aid from Government. But it will remain as a fact in the history of this department that, in the year 1865-66, as many as 31 private institutions, for the most part supported by different missionary bodies, have for the first time applied to Government for aid, which will be accorded to them during the current year, under our provisional revised rules, for grants-in-aid under the system of payment for results. This system, in supercession of former arrangements, was introduced by Government, at the recommendation of my predecessor, on the 26th of November 1863. The principle of payment for results, on its announcement, was cordially accepted by the missionary bodies, who considered that it would imply less intrusion into the details of their school management on the part of inspecting officers, than any other system of conditions for grants-in-aid that could be devised. But they objected to the particular terms offered by Mr. Howard, which they considered so illiberal as to make it not worth while to offer their schools for inspection under the rules in question. Mr. Howard's standards of examination and schedules of payment had been experimentally drawn up, with the express view to

to their being revised after experience of their working. While acting for Mr. Howard, in July 1864, I held a conference with the leading missionaries and managers of private schools, after which I submitted a new set of rules; and these, with some slight modifications, received the sanction of Government in February 1866. The present revised rules (which are given in Appendix E., page 167) are based on a computation of what would be necessary to allow any school which was in an efficient condition to receive from the State about one-third of its expenses on account of secular instruction. A reference to Appendix F., in which is given a table of the application for grants-in-aid actually received, will afford some anticipation of the working of the system. This table shows the amount which would be payable if every pupil passed in every head of the standard under which he was presented. As, however, the examinations will be strict, it can scarcely be expected that more than half of this maximum amount will actually be obtained by the institutions in question. The total cost of secular instruction in these institutions is returned as *Rs.* 1,06,296. 5. 7.; and I estimate that they will obtain about 21,792 rupees for the performances of their pupils, that is, little more than one-fifth of their total cost on account of secular instruction. It will always be in the power of school managers to increase the amount of their grants by increasing the efficiency of their schools, but it will require the attainment of great perfection to enable a school to get from Government more than one-third of its cost. Such is the principle on which the new system is based. It is a system which, as I have said, is popular with the missionaries, as implying the minimum of interference, and it is also satisfactory to this department, as implying the maximum of accuracy in the reports of inspecting officers. I am as yet only able to report on it by anticipation."

376. It will be observed that the only Provinces in which the system of "payment by results" (copied from the recent English system) has yet been introduced are Bombay, where it forms the basis of the grant-in-aid rules; Madras, where it forms as it were an appendage of the rules, and is intended primarily for application to elementary schools; and the Central Provinces, where also it is introduced as an appendage to the general system, and is intended solely for application to indigenous schools. The result can hardly as yet be judged of in respect of Madras and Bombay, as is evident from the information already given. As regards the Central Provinces, I may repeat here an extract already given in section V. (Lower Class Schools):—

"These schools may be divided into three classes:

"1st.—Those receiving a regular monthly grant from Government.

"2nd.—Those receiving grants under the payment by result rules.

"3rd.—Those receiving casual gifts, in money or books, for the masters or pupils.

* * * * *

"Of the 2nd class, during the past year, 25 schools have presented pupils for examination, and a total of 408-1 rupees has been paid; the largest amount paid to one school was 47-4 rupees. Of 273 pupils examined, about 20 per cent. failed. The only districts in which teachers have come forward to claim rewards are Saugor, Nimar, Nursingpore, and Nagpore. I do not feel satisfied that proper attention has been paid to this very important branch of our educational system, and district inspectors have not yet thoroughly explained the rules of the teachers. A number of schoolmasters in the Jubbulpore district, who received grants last year, refused to receive them this year; and one of the most intelligent of the class informed the inspector the reason was that the parents of the children objected strongly to his taking any aid from Government, they seemed to dread it as the insertion of the thin-end of some mysterious wedge. When the rules for regulating these payments by results were drafted, I thought them sufficiently liberal; but a revision will be necessary, as they are not so liberal as the rules in other parts of India, which have for many years enjoyed greater educational advantages than the Central Provinces. I shall submit shortly a revised code of rules."

377. I will conclude my remarks in this section with a very brief reference to the working of the special rules for grants to schools for European and Eurasian children.

378. These rules have given encouragement to a class of institutions which certainly merited it. There is scarcely a Presidency or Province in which one or more such institutions have not risen up under the rules in question. But the greatest development has been in the Punjab, where the number of such schools (chiefly in the hill stations) is very considerable.

There was a misunderstanding at first in some quarters, which was set right by the following orders of 26th March 1866 :

“ The Government aid granted to such institutions is regulated by the two following rules :—

(1.)—“ ‘ That to the sum collected from *private subscriptions* as a *Building and Foundation Fund*, an equal sum be added by the Government.’

(2.)—“ ‘ That from the opening of each school it should receive a grant-in-aid to the fullest extent allowed by the rules,’ viz. (as provided for in the grant-in-aid rules), a grant not exceeding half the expenditure on the school for the period for which the grant is given, and also not exceeding the amount made available from private sources ; ‘ private sources’ being held (under the resolution of January 1864) to include schooling fees.

“ From the above it is clear that it is only in respect of money *set apart as a Building or Foundation Fund* that the Government gives an equivalent without reference to the actual expenditure ; and that the money entitled to such an equivalent must be *bonâ fide*, ‘ collected from private subscriptions.’

“ The question raised by the Financial Department is, whether ‘ it was intended to allow an equivalent for tuition fees merely, or for the sums realised by the school for boarding expenses also.’ ‘ These latter,’ the Financial Department observes, ‘ do not ordinarily come within the category of fees.’

“ It is evident from the explanation already given, that this question can refer only to the grant given by Government, in aid of the current expenses, and applies alike to the case of all aided boarding schools, whether established under the special provisions of Lord Canning’s Minute or the ordinary grant-in-aid rules ; for the only respect in which Lord Canning’s Minute accords special grant-in-aid privileges is the offer of a grant as the equivalent of money funded for building or endowment purposes, and such money must be, *bonâ fide*, ‘ collected from private subscriptions.’

“ The question would more appropriately be worded as follows :

“ *In the case of boarding schools receiving a grant-in-aid from Government, is it allowable (with reference to the limitation of the Government grant to half the total expenditure) to include in the statement of total expenditure sums expended on boarding as distinguished from tuition ?*

“ On this point the Governor General in Council observes that it was never intended that the Government should pay anything towards boarding expenses, such as for the food and clothing of children ; and if, in some instances, a mistake may have been made on this point, it has arisen probably from the absence of any express order for distinguishing between the two classes of expenditure.

“ The required distinction can probably, his Excellency in Council thinks, be made without much difficulty by the observance of some general rule, to the effect that, in aided boarding schools, the salaries and other charges appertaining to the teaching establishment, expenses connected with the purchase of prizes, books, maps, and other educational apparatus, and also the house-rent (where a house has not been built or purchased with Government aid) may be regarded as tuition expenses ; all other charges being regarded as expenses for objects other than tuition. It is true that the house-rent in such cases is really, to a large extent, a charge on account not of tuition, but of lodging ; but, on the other hand, the above rule might, perhaps, exclude some miscellaneous items appertaining to tuition.

“ It will probably, in the opinion of the Governor General in Council, be better to adopt some such general rule, than to attempt, in each case, to scrutinise, in close details, the exact proportion between boarding and tuition charges. But this is a matter which his Excellency in Council is willing to leave to Local Governments to arrange ; with the understanding that provision must, in some way or another, be made for distinguishing between the two classes of expenditure, when that expenditure is calculated for the purpose of determining the amount of the aid to be given by the Government.”

March 1867.

A. M. Monteath.

APPENDICES to NOTE on the STATE of EDUCATION in INDIA,
1865-66.

APPENDIX (A).

GRANT-IN-AID RULES FOR BENGAL.

(Passed in March 1864.)

THE Local Government, at its discretion, and upon such conditions as may seem fit in each case (reference being had to the requirements of each district as compared with others, and to the funds at the disposal of Government), will grant aid in money, books, or otherwise, to any school under adequate local management, in which a good secular education is given through the medium either of English or the vernacular tongue.

2. In respect of any such school, for which application for aid is made, full information must be supplied on the following points:—

First. The pecuniary resources, permanent and temporary, on which the school will depend for support.

Secondly. The proposed monthly expenditure in detail.

Thirdly. The average number of pupils to be instructed.

Fourthly. The persons responsible for the management.

Fifthly. The nature and course of instruction.

Sixthly. The number and salaries of masters or mistresses.

Seventhly. The nature and amount of aid sought.

Eighthly. The existence of other schools receiving aid within a distance of six miles.

3. Any school to which aid is given, together with all its accounts, books, and other records, shall be at all times open to inspection and examination by any officer appointed by the local Government for the purpose. Such inspection and examination shall have no reference to religious instruction, but only to secular education.

4. The Government will not interfere with the actual management of a school thus aided, but will seek, upon the frequent reports of its inspectors, to judge from results whether a good secular education is practically imparted or not; and it will withdraw its aid from any school which may be, for any considerable period, unfavourably reported upon in this respect.

5. In giving grants-in-aid, the following principles will be observed:—

(a.) The Government will always endeavour so to give its aid that the effect shall not be the substitution of public for private expenditure, but the increase and improvement of education.

(b.) Grants will be given to those schools only (with the exception of normal schools and girls' schools) at which fees of reasonable amount are required from the scholars.

(c.) In no case will the Government grant exceed in amount the sum to be expended on a school from private sources.

(d.) For schools educating up to the University entrance standard, the Government grant will not, as a rule, exceed one-half of the income guaranteed from local sources.

(e.) For other schools in which the expenditure is more than 30 rupees per mensem, the Government grant will not, as a rule, exceed two-thirds of the income guaranteed from local sources.

(f.) The proportional amounts above laid down for Government grants are *maximum* amounts; and it must not be assumed that the *maximum* will in all cases, and as a matter of course, be sanctioned.

(g.) The conditions of every grant will be subject to revision periodically at intervals of five years commencing from the date of sanction.

6. It is to be distinctly understood that grants-in-aid will be awarded only on the principle of perfect religious neutrality, and that no preference will be given to any school on the ground that any particular religious doctrines are taught or not taught therein.

GRANT-IN-AID RULES FOR THE NORTH WESTERN PROVINCES.

(Passed in October 1864.)

Article I. THE object of a system of grants-in-aid is to promote private enterprise in education, under the inspection of officers appointed by the Government.

II. The means consist in aiding voluntary local exertion, under certain conditions, to establish and maintain schools.

III. Those conditions, generally stated, are—

(1.) That the school is under competent management.

(2.) That the funds, on which the local expenditure is based, are stable.

(3.) That the extended operations, to be brought into play by Government assistance, are justified by the wants of the locality, and by the school accommodation provided.

(3*a.*) That schooling-fees are paid by at least three-fourth of the pupils; those exempted from payment being *bonâ fide* indigent (excepting in cases of normal, orphan and female schools, in which no tuition fee need be exacted).

IV. Managers of schools desirous of receiving State assistance are, therefore, required to submit, with their application for a monthly grant (the amount being noted) a statement, through the Director of Public Instruction, which shall inform the local Government—

(1.) Of the name or names of the person or persons responsible for the management of the school, and for the disbursement of all funds expended on the same, it being stated whether such person or persons are resident or non-resident, and how long he or they are expected to be responsible.

(2.) Of the following particulars:—

(*a.*) The resources (in detail) at the disposal of the above, to augment which resources a monthly grant is asked for.

(*b.*) The number, qualifications, and salary of the teachers employed, or to be employed, there being ordinarily a teacher for every 30 boys in average attendance.

(*c.*) The average attendance registered or anticipated.

(*d.*) The extent, in cubic feet, of the internal school accommodation provided, with short notice of site and locality.

(*e.*) The scholastic regulations (as to attendance, fees, fines, &c.) in force, or to be enforced.

(*f.*) The books studied, or to be studied (detailed list).

V. The grant asked for must not exceed, as a general rule, the monthly income noted under (*a.*) in the statement defined by Article IV. above.

N.B.—The monthly income may include the amount of fees collected.

VI. The grants, after allotment, are payable month by month from the beginning of the official year next succeeding the submission of application, provided that the Budget Estimates of the year admit of the expenditure.

N.B.—It is necessary that applications for new grants be registered in the Director's office before the preparation of Budget Estimates in October.

VII. No grants are made to schools which are not open to examination by the Government inspectors.

VIII. "The inspectors are to take no notice whatever of the religious documents which may be taught in any school, but are to confine themselves to the verification of the conditions on which the grants are made, to collect information, and to report the results."

IX. The continuance of a grant depends on the favourable report of the inspector, submitted after his periodical visit before the end of the official year.

X. The

X. The grant may be either withheld or reduced for causes arising out of the state of the school, to wit—

(a.) If the school is found to be held in an unhealthy, or otherwise undesirable, locality, after due notice from the inspector.

(b.) If the teachers have not been regularly paid, or are manifestly incapable.

(c.) If the attendance has been exceptionally irregular, or if the register be not kept with sufficient accuracy to warrant confidence in the returns.

XI. In every aided school are to be kept, besides the ordinary register of attendance,—

(a.) A book in which the names of all scholars admitted, with date of admission, and age at the time of admission, are entered. The father's or guardian's name is to be added in each case. The same book will serve for the registry of withdrawals or dismissals.

(b.) A log-book, in which the managers or the head teacher may enter occurrences of an extraordinary nature affecting the interests of the school. No entry once made can be removed or altered, except by a subsequent entry of correction, and all entries are to be dated and attested.

XII. The inspector will call for these books at his annual visit, and will enter in the latter such remarks as he may have to make on the state of the school, forwarding copies of the same to the office of the Director of Public Instruction before the end of the official year.

XIII. In cases of special excellence, the teachers may be rewarded, on the inspector's recommendation, such reward to count as an adjunct to the grant for the ensuing year. A certificate of merit will be given to such teachers at the discretion of the Director of Public Instruction.

In collegiate aided schools, the students who pass the Calcutta University examinations will be recommended for scholarship allowances.

XIV. *Female Education.*—Girl's schools will receive liberal encouragement on the principles laid down in Article III., so long as the Government is satisfied that the management of the same is in unexceptionably trustworthy hands.

N.B.—The inspection of these schools by Government officers will not, as a rule, be enforced.

XV. *Grants for Building, and other Special Purposes.*—Aid is not granted towards the erection of private schools, unless the local Government is satisfied that the conditions for ordinary grants-in-aid laid down in Article III. are fulfilled.

XVI. Grants made for building, enlarging, improving, or fitting up schools, do not exceed the total amount contributed for the same purpose by proprietors, residents, agents, or others, within the district where the school is located.

Such contribution may be in the form of—

(a.) Individual subscriptions.

(b.) Allotments from benevolent societies.

(c.) Materials, at the market rates.

(d.) Sites, given without valuable consideration.

(e.) Cartage.

XVII. The sites, plans, estimates, &c., must be satisfactory to the Local Government.

XVIII. The extension of the area of existing school-rooms to receive more scholars is treated, *pro tanto*, as a new case under Articles XV. *et seq.*, above.

XIX. "In the event of any building towards the erection, purchase, enlargement, or repair of which a grant may have been made by the Government, being subsequently diverted to any other than educational purposes, the Government shall have the option of purchasing the building at a valuation to be determined by arbitrators, credit being given for the amount of the grant which may have been made by the Government."

GRANT-IN-AID RULES FOR THE PUNJAB.

(Passed in June 1865.)

Article I. THE object of a system of grants-in-aid is to promote private enterprise in education, under the inspection of officers appointed by Government, with a view to Government being thus enabled gradually to withdraw, in whole or in part, from the task of direct instruction through Government establishments, in compliance with the hope expressed by the Right honourable the Secretary of State for India, "that private schools aided by Government would eventually take the place, universally, of the several classes of Government institutions."

II. The means consist in aiding voluntary local exertion, under certain conditions, to establish and maintain schools.

III. These conditions, generally stated, are—

- (1.) That the school is under competent management.
- (2.) That the instructive staff is adequate—there being ordinarily a teacher for every 30 boys in average attendance.
- (3.) That the funds, on which the local expenditure is based, are stable.
- (4.) That the extended operations to be brought into play by Government assistance are justified by the wants of the locality (due regard being had to the relative requirements of the institutions seeking aid, and to the funds available to meet them), and by the school accommodation provided.

IV. Managers of schools desirous of receiving State assistance, are, therefore, required to submit, with their application for a monthly grant (the amount being noted) a statement through the Director of Public Instruction, which shall inform the Local Government—

- (1.) Of the name or names of the person or persons responsible for the management of the school, and for the disbursement of all funds expended on the same—it being stated whether such person or persons are resident or non-resident, and how long he or they are willing to be responsible.
- (2.) Of the following particulars:—
 - (a.) The resources (in detail) at the disposal of the above, to augment which resources a monthly grant is asked for. The resources as above may include the amount of school fees collected.
 - (b.) The number, names, qualifications, and salaries of the teachers employed or to be employed, and a statement of the total expenditure incurred or to be incurred in the maintenance of the school on its proposed footing.
 - (c.) The average attendance registered or anticipated.
 - (d.) The extent in cubic feet of the internal school accommodation provided, with short notice of site and locality.
 - (e.) The scholastic regulations (as to attendance, fees, fines, &c.) in force or to be in force.
 - (f.) The books studied or to be studied (detailed list).

V. The grant asked for must not exceed the monthly income or half the expenditure, as noted under Clauses (a) and (b) respectively of Section 2 of Article IV. This amount is a maximum, and only such portion of it should be given as may be deemed proper, with reference to the circumstances of the case, the funds available, and the general requirements of the Province.

VI. The grants, after allotment, will be payable month by month, from the month succeeding each allotment. New grants will not be allotted till it is known that budget provision is available; and it is distinctly to be understood that the expenditure on grants-in-aid for the year will be strictly confined within the budget grant, and that no institution which cannot be provided for within that grant will receive any assistance until the close of the current financial year.

N.B. It is necessary that applications for new grants be registered in the Director's office, before the preparation of the Budget Estimates, in October.

VII. No grants will be made to schools which are not open to examination by the Government inspectors, and in which, with the exception of female, normal, and purely vernacular schools, some fee is not taken from at least three-fourths of the scholars.

VIII. The inspectors are to take no notice whatever, in the case of schools for children of other than Christian parents, of the religious doctrines which may be taught, but are to confine themselves to the verification of the conditions on which the grants are made, to collect information, to report the results, and to suggest improvements in the general arrangements of the school.

IX. Grants-in-aid will be withdrawn or reduced, if, in the opinion of the Local Government, the institution does not continue to deserve any or so much assistance from the public revenues.

X. The grant may be either withheld or reduced for causes arising out of the state of the school, to wit—

- (a.) If the school is found to be held in an unhealthy, or otherwise undesirable locality, after due notice from the inspector.
- (b.) If the teachers have not been regularly paid, or are manifestly incapable or otherwise unfitted for their posts.

(c.) If

(c.) If the attendance has been exceptionally irregular, or if the register be not kept with sufficient accuracy to warrant confidence in the returns.

(d.) If from any cause the progress of the school is so unsatisfactory as to make it evident that it does not fulfil the educational objects for which the grant was given.

XI. In every aided school are to be kept, besides the register of attendance, the following books:—

(a.) An account book, in which all receipts and disbursements of the school shall be regularly entered and balanced from month to month.

(b.) A book in which the names of all scholars admitted, with date of admission and age at the time of admission are entered. The father's or guardian's name is to be added in each case. The same book will serve for the registry of withdrawals or dismissals.

(c.) A log book, in which the managers or head teacher may enter occurrences of an unusual character affecting the interests of the school. No entry once made can be removed or altered, except by a subsequent entry of corrections, and all entries are to be dated and attested.

XII. These books will be open to the inspector at his annual visit, and he will enter in the appropriate place such remarks as he may have to make on the state of the school, forwarding copies of the same to the office of the Director of Public Instruction before the end of the official year.

XIII. In case of the excellence of a school being established to the satisfaction of the Director of Public Instruction, by success at such periodical examinations as he may from time to time determine, a special grant may be given not exceeding one month's average expenditure of the school, subject to the general limitation to the effect that the total aid given by the Government in any year shall not exceed half of the total expenditure on the school for that period. Such special grant will count as an adjunct to the grant for the ensuing year, and must be laid out by the managers in rewards to the most deserving teachers and scholars in such manner as they may prefer, unless the particular mode of its distribution is prescribed by the Director of Public Instruction and agreed to by the managers of the school. Besides making special awards to teachers from extra grants, the Director may, with the consent of the managers, bestow certificates of merit on them.

XIV. In purely vernacular schools which are unable to comply with all the conditions imposed by the preceding articles, but which are found to impart adequate elementary instruction, special grants may be awarded from time to time on the recommendation of the Inspector of Schools. But the sum of such special grants to any one purely vernacular school shall not exceed during the official year one-half the average annual cost of a Government vernacular school of a similar size and standard.

XV. *Female Education.*—Girl's schools will receive encouragement on the principles laid down in Articles III. and V., so long as the Government is satisfied that the management of the same is in unexceptionably trustworthy hands.

N.B. The inspection of these schools by Government officers will not, as a rule, be enforced.

XVI. *Grants for Building and other Special Purposes.*—Aid of this sort will not be granted to private schools, unless the Local Government is satisfied that the conditions for ordinary grants-in-aid, laid down in Article III., are fulfilled.

XVII. Grants made for buildings, or enlarging, improving, or fitting up schools, must not exceed the total amount contributed from private sources for the same purpose, and the full amount will not be given as a matter of course.

Such contributions may be made in the form of:—

(a). Individual subscriptions.

(b). Allotments from benevolent societies.

(c). Materials (at the market rates).

(d). Sites given without valuable consideration.

(e) Cartage.

XVIII. The sites, plans, estimates, &c. must be satisfactory to the Local Government.

XIX. The extension of the area of existing school rooms to receive more scholars is treated *pro tanto*, as a new case under Article XVI., *et seq.*, above.

XX. In the event of any building towards the erection, purchase, enlargement or repair of which a grant may have been made by the Government being subsequently devoted to any other than educational purposes, the Government shall have the option of purchasing the building at a valuation to be determined by arbitrators, credit being giving for the amount of the grant which may have been made by the Government.

XXI. To school libraries, and libraries intended for the use of the native community, grants will be made to such extent as may seem fitting in each case, and subject to the condition that at least an equal sum shall be contributed towards the object from private sources.

GRANT-IN-AID RULES FOR MADRAS.

(*Passed in January 1865.*)

GRANTS in aid of schools and other educational institutions will be made with the special object of extending and improving the secular education of the people, and will be given impartially to all schools (so far as the funds at the disposal of Government may admit), which impart a sound secular education, upon the conditions hereafter specified. It will be essential to the consideration of applications for aid that the schools on behalf of which they are preferred shall be under the management of one or more persons, who, in the capacity of proprietors, trustees, or members of a committee elected by the society or association by which the school may have been established, will be prepared to undertake the general superintendence of the school, and to be answerable for the permanence for some given time.

II. Every application for a grant must be accompanied by a declaration that the applicant or applicants are prepared to subject the institution on behalf of which the application is made, together with its current accounts, list of establishment, time table, scheme of studies, and registers of attendance, to the inspection of a Government inspector, such inspection and examination relating only to the general management and to the secular instruction, and having no reference to any religious instruction which may be imparted.

III. Except in the case of normal schools for training teachers, and of female schools, grants will be restricted to those schools in which a monthly schooling fee, of an amount to be approved by the Director of Public Instruction, and which in general is not to fall below one anna, is paid by at least three-fourths of the pupils.

IV. It will be open to managers of schools, who desire to obtain grants on the results of periodical examinations of the pupils, to submit their schools to examination according to the standards described in Schedule (A.) appended to this notification, and to obtain grants at the rates provided for in Schedule (B).

V. In other cases the grants will be made only for specific purposes, and not in the form of contributions in aid of the general expenses of a school; and it will be essential to the payment of the grants that the proportion which, under the following rules, the managers are required to contribute for the purpose for which the grants may have been sanctioned shall have been duly paid. Subject to the conditions prescribed in these rules, a grant, not exceeding in amount the sum contributed by the managers of a school, will be given in aid of the salary of each schoolmaster or schoolmistress, who may have obtained a certificate of qualification from the Director of Public Instruction. A grant, not exceeding one-half of the sum contributed by the managers of the school, will be given in aid of the salary of each schoolmaster or schoolmistress in regard to whom the managers may satisfy the Director of Public Instruction, either by the report of a Government Inspector of Schools, or by such other means as the Director of Public Instruction may consider sufficient, that the said teacher is fairly qualified to perform the duties which are entrusted, or which it may be proposed to entrust, to him or her; provided that, in such cases, the amount of the grant to be given shall bear a due proportion to the amounts sanctioned in the following rules for teachers holding certificates, and that the exact amount to be assigned in each case shall be determined by the Director of Public Instruction.

VI. The following are the specific objects for which, and the conditions upon which, grants will ordinarily be given:—

- 1st. The payment, in part, of the salaries of schoolmasters and mistresses.
- 2nd. The payment of normal and certain other scholarships.
- 3rd. The provision of books of reference, maps, &c., and in some cases of school books.
- 4th. The establishment and maintenance of school libraries and public libraries.
- 5th. The erection, purchase, enlargement, or repair of school buildings.
- 6th. The provision of school furniture.

VII. The tests to be passed by teachers to entitle them to certificates shall be of a three-fold character: *The first*, relating to general education, *the second* to theoretical knowledge of school management, and *the third* to teaching power, as practically exemplified by teaching a class in the presence of an Inspector of Schools.

VIII. *Grants to Schoolmasters.*—The certificates to be awarded to schoolmasters will be
of

of five grades ; and, as regards the general education test, candidates for certificates of the first three grades will be required to have passed one of the Madras University examinations according to the grade of certificate which the candidate may seek to obtain, viz. :—

For the 1st grade, the examination for the degree of B. A.

„ 2nd „ the 1st examination in Arts.

„ 3rd „ the matriculation examination.

IX. The general education tests for the 4th and 5th grades of schoolmasters will be those specified in Schedule (C).

X. A certificate of the 1st grade will render the holder eligible to such grant, not exceeding the amount contributed by the managers of the school in which he is employed, as the Director of Public Instruction, with the sanction of Government, may determine, due regard being had to the amount of funds available for expenditure on grants-in-aid. Certificates of the other grades will render the holders eligible to the following grants, provided that the amount of the grant shall not exceed the amount contributed by the managers of the school, and that it shall be competent to the Director of Public Instruction to assign a grant lower than the maximum, with reference to the manner in which the candidate may have acquitted himself in the certificate examination :

	<i>Rs.</i>
A certificate of the 2nd grade, to a monthly grant, not exceeding -	75
„ 3rd „ „ „ - - -	50
„ 4th „ „ „ - - -	25
„ 5th „ „ „ - - -	10

Ordinarily the maximum grant will not be assigned to a teacher on being first employed in that capacity.

XI. In the case of masters employed in schools intended mainly for European or East Indian pupils, the examination for certificates of the 4th or 5th grades may be conducted in English, and in such cases the language test for the 5th grade shall be that which is prescribed in the schedule as the English test for the 4th grade.

XII. Graduates of universities in Europe, America and Australia, and of other Indian universities, and holders of certificates granted by the Councils of Education in England or Ireland, will be placed in such grades as, in the judgment of the Director of Public Instruction, their attainments and other qualifications may render appropriate.

XIII. *Grants to Schoolmistresses.*—Certificates for schoolmistresses will be of three grades :

A certificate of the 1st grade will render the holder eligible to such grant, not exceeding the amount contributed by the managers of the school in which she is employed, as the Director of Public Instruction, with the sanction of Government, may determine, due regard being had to the amount of funds available for expenditure on grants-in-aid. Certificates of the other grades will render the holders eligible to the following grants, provided that the amount of the grant shall not exceed the amount contributed by the managers of the school, and that it shall be competent to the Director of Public Instruction to assign a grant lower than the maximum, with reference to the manner in which the candidate may have acquitted herself in the certificate examination :—

	<i>Rs.</i>
A certificate of the 2nd grade, to a monthly grant, not exceeding -	25
„ 3rd „ „ „ - - -	10

Schoolmistresses holding certificates from the Councils of Education in England or Ireland will be placed in the 1st grade, and will be assigned such grants as the Director of Public Instruction may deem proper.

XIV. The general education tests for all grades of schoolmistresses will be those specified in Schedule (D).

XV. The examination of schoolmasters, candidates for certificates of the first three grades in the theory of school management, and the examination of all other candidates in all their subjects, will be held once a year in July, or at such other time as may be hereafter appointed.

XVI. All grants in aid of the salaries of schoolmasters and mistresses will be paid monthly ; their continuance will depend in each case upon the annual report of the Inspector of the Division that the school or class under the masters or mistresses' charge has been satisfactorily conducted during the previous year.

XVII. Grants made to elementary schools on the results of periodical examinations of the pupils, as provided for in Schedules (A.) and (B.), will be paid annually, half-yearly, or quarterly, as the Director of Public Instruction may decide in communication with the managers of the school, provided that the amount to be given for a single year shall not exceed the rates entered in Schedule (B).

XVIII. Scholarship

XVIII. Scholarship grants will be issued to well-organised normal schools conducted by certificated teachers; each application will be disposed of on its merits.

XIX. Besides the scholarship grants above mentioned, a certain number of scholarships will be given each year upon the results of the university matriculation examination. These will be tenable for three years, under conditions to be laid down by the Director of Public Instruction, at such colleges or schools as may be so organised as to allow of the holders being educated up to the standard of the B. A. examination.

XX. Grants for the provision of books of reference, maps, &c., for schools will be made on the following terms:—

(a.) A grant will be made to every school favourably reported on by the inspector, at rates not exceeding those noted in the margin, provided that a sum equal to the amount of the grant be contributed for the same purpose by the managers of the school.

In the case of a school in which the head master, or one of the assistant masters, may hold a certificate of the first grade, at the rate of 10 annas per head of the average attendance during the preceding quarter.

In the case of a school in which the head master, or one of the assistant masters, may hold a certificate of the second or third grade, at the rate of eight annas per head of the average attendance during the preceding quarter.

In the case of a school in which the head master, or one of the assistant masters, may hold a certificate of the fourth or fifth grade, at the rate of six annas per head of the average attendance during the preceding quarter.

(b.) No further application for a grant of books of reference, maps, &c., will be complied with for a period of five years from the date of the previous grant.

(c.) After the lapse of five years from the date of the last grant, a renewal grant will be made at rates not exceeding those noted above, and with the proviso already laid down.

(d.) Grants for the provision of books of reference, maps, &c., will be made in money. Applications for such grants must be accompanied by a list of the books required; and, on the Director of Public Instruction satisfying himself of the propriety of complying with the application, prospective sanction will be given for the issue of the grant, which will be paid on the Government inspector reporting that the articles have been procured and are ready for use.

XXI. A grant for the provision of school books will be issued to *bonâ fide* pauper schools, at a rate not exceeding eight annas a head upon the average attendance of the preceding three months; the managers of the schools contributing in every case an equal amount. After the expiration of three years, a renewal grant will be issued upon the same terms.

XXII. Grants will be made in aid of school and public libraries to such extent as may seem fitting in each case, and subject to the condition that an equal sum shall be contributed by the managers.

XXIII. Grants will be made towards the erection, purchase, or enlargement of a school building on the following conditions:—

1st. That in each case an equal sum shall be contributed by the managers of the school for the same purpose.

2nd. That satisfactory evidence shall be adduced of the necessity for the erection, purchase, or enlargement, in aid of which the grant is sought.

3rd. That the amount applied for shall not exceed what may be considered reasonable, taking into account the Budget provision for the year, the importance of the school, and any previous grants which may have been issued to the managers of the institution.

4th. That the application shall be accompanied by a plan and estimate of the cost of the building proposed to be erected, purchased, or enlarged.

5th. That previous to the disbursement of the grant, which will be made in two equal portions—one after the execution of half the work, the other upon the completion of the whole—it shall be certified by the inspector of the division, or other responsible officer who may have been deputed to examine the building, that the work has been proceeded with as provided for in the plan and estimate previously sanctioned by the Director of Public Instruction. Also that, before disbursement, the managers of the school shall declare that they have funds on hand sufficient, when supplemented by the grant, to clear off all the debts incurred in the execution of the work.

6th. That in the event of any building towards the erection, purchase, or enlargement of which a grant may have been made by Government being subsequently diverted to other than educational purposes, the Government shall have the option of purchasing the building at a valuation to be determined by arbitrators, credit being given for so much of the grant as may bear the same proportion to the whole which the estimated value of the building bears to the total original cost.

7th. That in such cases the arbitrators shall be three in number, of whom two shall be nominated by Government, and one by the managers of the school.

XXIV. Grants for the provision of school furniture will be made once in five years, on condition that the managers of the school shall contribute an equal sum for the same purpose;

pose; and that, in the event of the school being permanently closed within five years from the date on which the grant may have been made, the Government shall be at liberty to purchase the furniture towards the supply of which the grant was given at a valuation, to be determined, as in the case of school buildings, by arbitrators, credit being taken in each case for the amount of the grant, allowing for depreciation due to wear and tear. All applications for grants must be accompanied by a list of the furniture required. A furniture grant will be paid on the Director of Public Instruction being satisfied that furniture to the full amount proposed to be expended, including both local contributions and the Government grant, has been made up and placed in the school.

XXV. Applications for grants in aid of industrial schools, and for other purposes not provided for in this notification, will be disposed of on their merits, each case being determined, as far as possible, by an analogy of the foregoing rules.

SCHEDULE (A).

STANDARDS OF EXAMINATIONS.

A.—*European and Eurasian Schools.*

First (Lowest) Standard.

1. Reading—Words of one syllable.
2. Writing—Any letter or digital number on a slate.

Second (Middle) Standard.

1. Reading—Easy child's book intelligibly.
2. Writing—Large-hand fairly.
3. Arithmetic—First four rules.

Third (Highest) Standard.

- | | |
|---------------------------------|---|
| 1. Reading—(As of a newspaper). | } Sufficient for a mechanic (or mechanic's wife). |
| 2. Writing—(Running hand). | |
| 3. Arithmetic. | |

B.—*Native Schools.*

First (Lowest) Standard.—Vernacular.

1. Reading—(Easy school books) clear and intelligent.
2. Writing—Legible to dictation in the ordinary current hand, without gross mistakes.
3. Arithmetic—(Inclusive of Rule-of-three) sufficient for market and household purposes.

Second (Middle) Standard.—Vernacular.

1. Reading—(Advanced) and explanation.
2. Writing—Good and correct to dictation.
3. Arithmetic—Complete.

Third Standard.—Anglo-Vernacular.

1. English Reading (easy poetry and history.)
 2. Translation into vernacular on paper.
 3. Writing English to dictation (such as Goldsmith's "History of England") without three gross mistakes.
 4. Arithmetic (complete) and mensuration.
-

SCHEDULE (B).

GRANTS TO PUPILS PASSED UNDER THE SEVERAL STANDARDS.

A.—European and Eurasian Schools.

		Hill Schools.	Schools in the Plains.
		Rs.	Rs.
To each pupil passed under	1st Standard - - -	4	2
	2nd „ - - -	8	5
	3rd „ - - -	12	10
B.—Native Schools.			
To each pupil passed under	1st Standard - - -	-	2
	2nd „ - - -	-	5
	3rd „ - - -	-	10

SCHEDULE (C).

Writing Tests for Schoolmaster's Certificates.

Grades.	Subjects of Examination, and Text Books recommended.	Remarks.
Fourth Grade	<i>English</i>.—Second and Third Books of Lessons, Madras School Book Society— Selections in poetry, No. 1. Grammar (an Elementary Knowledge). <i>Tamil</i>.—Third Book of Lessons—Public Instruction Press. Panchatantra. Pope's Poetical Anthology. Nannul (by Savundranaiyagam) Pillai Verbs and Syntax. Pope's Second Grammar. <i>Telugu</i>.—Third Book of Lessons—Public Instruction Press. Niti Chendrika. Nala Charitra. Venkiah's Grammar. Chinniah Suri's Grammar—Chapters on Karaka and Samasa. <i>Canarese, Malayalam, and Oriya</i>, in accordance with Tamil and Telugu as far as practicable. <i>Arithmetic</i>.—Colenso's generally, omitting Duodecimals, Cube-root, and Stocks. Also, the Chief Indian Weights and Measures. <i>Geometry</i>.—Euclid, Book I. <i>History</i>.—Morris's History of India (generally). Brief Sketches of Europe. <i>Geography</i>.—The Manual—Asia and India in particular; general notions regarding the world and the outlines of Europe. <i>Method</i>.—Fowler's work, or Murdoch's Hints. <i>N.B.</i>—Very discreditable writing, figures, or spelling, will cause a candidate to be rejected. For lesser deficiencies in these respects, deductions will be made from the marks which would otherwise be assigned to the answers.	The examination in the non-language subjects will be, in general, conducted in the vernaculars.

Schedule (C).—*Writing Tests for Schoolmasters' Certificates*—continued.

Grades.	Subjects of Examination, and Text Books recommended.	Remarks.
Fifth Grade	<i>Tamil</i>.—Second and Third Readers—Public Instruction, Press, Panchatantra, Part I. Pope's Catechism of Grammar. <i>Telugu</i>.—Second and Third Readers—Public Instruction, Press, Panchatantra, Part I. Sheshaya's Grammar. <i>Canarese, Malayalam, and Oriya</i>, in accordance with Tamil and Telugu. <i>Arithmetic</i>.—Four simple and compound rules, with the principal Indian weights and measures. <i>History</i>.—Brief sketches of Asia. <i>Geography</i>.—India in general, with the Madras Presidency in particular; general notions of the world, and outlines of Asia. <i>N.B.</i>—Fair proficiency in handwriting, making of figures, and spelling will be required.	

SCHEDULE (D).

Writing Tests for Schoolmistress's Certificates.

Grades.	Subjects of Examination, and Text Books recommended.	Remarks.
First Grade	<i>English</i>.—Selections in English Poetry, No. 2. Selections in English Prose. Grammar, as in Sullivan or McLeod. <i>Tamil</i>.—Third Book of Lessons—Public Instruction Press. Pope's Poetical Anthology. Pope's Second Grammar. <i>Telugu</i>.—Third Book of Lessons—Public Instruction Press. Vemana Selections. Venkiah's Grammar. <i>Canarese, Malayalam, and Oriya</i>, to agree with Tamil and Telugu as far as practicable. <i>History</i>.—Morris's India and England. <i>Geography</i>.—Manual. <i>Arithmetic</i>.—Colenso's, but omitting Compound Proportion, Duodecimals, Cube-root, and Stocks. <i>Method</i>.—Fowler's work, or Murdoch's Hints. <i>Needlework</i>.—Ability to cut out, and make up a shirt or jacket. <i>N.B.</i>—Very discreditable writing, figures, or spelling will cause a candidate to be rejected. For lesser deficiencies in these respects, deductions will be made from the marks which would otherwise be assigned to the answers.	

Schedule (D).—*Writing Tests for Schoolmistress's Certificates*—continued.

Grades.	Subjects of Examination, and Text Books recommended.	Remarks.
Second Grade -	<i>English</i>.—Second and Third Books of Lessons—Madras School Book Society. Selections in Poetry, No. 1. Grammar (elementary knowledge). <i>Tamil</i>.—Third Book of Lessons—Public Instruction Press. Pope's Poetical Anthology. Catechism of Grammar. <i>Telugu</i>.—Third Book of Lessons—Public Instruction Press. Vemana Selections. Sheshaya's Grammar. <i>Canarese, Malayalam, and Ooriya</i>, to agree with Tamil and Telugu as nearly as practicable. <i>History</i>.—Brief sketches of Europe and Asia. <i>Geography</i>.—Manual—Europe and Asia generally; India in particular. <i>Arithmetic</i>.—Colenso's, including Vulgar Fractions, and Simple Proportion, but omitting Decimals, as well as what is not required for First Grade. <i>Method</i>.—Fowler's work or Murdoch's Hints. <i>Needlework</i>.—Ability to make up a shirt or jacket which has been cut out. <i>N.B.</i>—Very discreditable writing, figures, or spelling, will cause a candidate to be rejected. For lesser deficiencies in these respects, deductions will be made from the marks which would otherwise be assigned to the answers.	
Third Grade -	<i>Tamil</i>.—First and Second Readers—Public Instruction Press. <i>Telugu</i>.—First and Second Readers—Public Instruction Press. So in other languages. <i>Geography</i>.—India, outlines of Asia, and general notion of the world. <i>Arithmetic</i>.—Four simple and compound rules. <i>Needlework</i>.—Ability to hem neatly. <i>N.B.</i>—Fair proficiency in handwriting, making of figures, and spelling will be required.	

PROVISIONAL REVISED GRANT-IN-AID RULES FOR BOMBAY.

(Passed in February 1866.)

AID will henceforward be experimentally given to schools under recognised management in accordance with the following rules, which supersede those published in the "Government Gazette" of the 8th June 1858 and the 26th November 1863, and which will remain in force for two years from the present date, being then subject to revision as experience may show to be needed :—

I. The managers of schools who may be desirous of receiving aid from the State must, on their first application, be registered in the office of the Director of Public Instruction, at least six months before the commencement of the official year then next following.

II. The application for registration must be accompanied by one or other of the forms appended (*see* Schedule C.), which must afford full information on the points enumerated.

III. All registered schools will be inspected once during the official year, by the Government Inspecting Officer, who will give notice to the managers beforehand of the probable time of examination.

IV. Provided that, if the inspecting officer on his visit shall consider the arrangements of any schools to be palpably defective as regards accommodation, registry of attendance, or otherwise, he may decline to examine, forwarding however a full report of his reasons for so declining to the Director of Public Instruction and the school managers.

V. The Inspecting Officer will examine all the pupils submitted to him according to the standard for which they may be respectively presented (*see* Schedule A.), and will furnish the managers with a certificate of the number of pupils passed by him under each standard and of the number entitled to capitation.

VI. The number of pupils presented for examination must in no case exceed the average number who have been in attendance during the previous 12 months, and no pupil will be examined who has not attended the school for at least the one month immediately preceding the examination.

VII. It is to be understood that no pupil, except in European and Eurasian schools, shall be allowed to pass twice under the same standard, or to be examined for a certificate more than once during the official year.

VIII. No pupil will be examined, or have his attendance counted, in calculating the average attendance, who is below six or above 22 years of age.

IX. After each examination the manager should forward to the Educational Inspector an abstract for the amount to which they may be entitled under Standards I. to V. of Schedule B., accompanied by the certificate mentioned in Rule V.

X. Grants for matriculation will only be awarded to a school in the case of boys who have attended that school for two full years preceding. Applications on this account should be forwarded to the Director of Public Instruction by the managers immediately after the matriculation examination, accompanied in each case by a copy of the University Registrar's certificate, and an authenticated statement of the boy's attendance at the school.

XI. Schools which at present receive aid from the State cannot, unless they elect to renounce such aid, present pupils for examination under these rules. But this provision is not in any way meant to affect the allowances made by the State to soldiers' orphans.

XII. Aid may also be granted under the above rules to such private schools as are considered by the Educational Department to be under proper management.

XIII. All schools receiving aid from the State under the above rules will be required to furnish all returns called for by the Government of India.

XIV. It is to be clearly understood that grants cannot be claimed under the above rules irrespective of the circumstances of the case, and the limits of the sum at the disposal of Government. Should a grant be in any case refused, the reasons for refusal will be communicated to the applicants, and will also be published in the Administration Report of the Educational Department.

SCHEDULE (A).

STANDARDS OF EXAMINATION.

For European and Eurasian Schools.

I.—Standard :—

1st head.—Multiplication tables and simple addition.

2nd head.—Reading, easy child's book, and writing words of one syllable.

II.—Standard :

1st head.—Arithmetic, first four rules.

2nd head.—Reading, easy narrative.

3rd head.—Writing, large hand.

III.—Standard.

1st head.—Arithmetic, to rule of three inclusive.

2nd head.—Writing, fair small hand.

3rd head.—(a.) Repetition of 100 lines of easy poetry.

(b.) Reading, as of a newspaper.

4th head.—Writing to dictation from the same.

IV.—Standard :

1st head.—Mathematics :

(a.) Arithmetic, to vulgar and decimal fractions.

(b.) Euclid, to the 10th proposition, First Book.

(c.) Algebra, up to multiplication and subtraction.

2nd head.—English :

(a.) Reading and explanation of easy English classics.

(b.) Recitation of classical poetry, 300 lines.

(c.) Dictation, including handwriting.

(d.) Grammar, rules of syntax.

3rd head.—Second language, *i. e.*, either Latin, Sanscrit, or any vernacular language.

Written translation into English of easy sentences.

V.—Standard :

1st head.—Mathematics :

(a.) Arithmetic, complete with mensuration.

(b.) Euclid, First Book, with simple deductions.

(c.) Algebra, to simple equations.

2nd head.—English :

(a.) Paraphrase of English poetry.

(b.) Grammar and analysis of sentences.

(c.) Composition on a given subject.

3rd head.—Second language, *i. e.*, either Latin, Sanscrit, or any vernacular languageWritten translation into English from any ordinary school book, and *vice versâ*.

VI.—Standard :

Matriculation in the University of Bombay.

N.B.—Under each of the 3rd, 4th, and 5th standards pupils may be allowed to pass twice, but not more than twice.*For Anglo-Vernacular Schools.*

I.—Standard :

1st head.—Arithmetic : Four simple rules.

2nd head.—English :

(a.) Reading of First and Second Books, with explanation.

(b.) Spelling, easy words.

(c.) Writing, large hand.

3rd head.

3rd head.—Vernacular :

- (a.) Reading Third Book, with explanation.
- (b.) Writing easy words.

II.—Standard :

1st head.—Arithmetic : Reduction and four compound rules.

2nd head.—English :

- (a.) Reading and explaining Third Book.
- (b.) Writing half text.
- (c.) Grammar, parts of speech.
- (d.) Written translation into English of easy sentences.

3rd head.—Vernacular :

- (a.) Reading Fourth Book, with explanation.
- (b.) Writing.
- (c.) Grammar, declensions and conjugations.

III.—Standard :

1st head.—Arithmetic : To simple proportion and interest, inclusive.

2nd head.—English :

- (a.) Reading Fourth Book, with *vivâ voce* explanation in English or vernacular.
- (b.) Parsing easy sentences.
- (c.) Writing, fair small hand.

3rd head.—Vernacular :

- (a.) Reading senior school books, with explanation.
- (b.) Writing easy sentences to dictation.
- (c.) Easy parsing.
- (d.) Written translation into English from any ordinary school book.

IV.—Standard :

1st head.—Mathematics :

- (a.) Arithmetic up to compound proportion and vulgar and decimal fractions.
- (b.) Euclid, to the end of the 10th proposition, First Book.
- (c.) Algebra, multiplication and subtraction.

2nd head.—English :—

- (a.) Reading senior school books, with explanation.
- (b.) Dictation, including handwriting.
- (c.) Grammar, common rules of syntax.

3rd head.—Vernacular :

- (a.) Translation from English into vernacular, or *vice versâ*, of any senior school book.
- (b.) Writing to dictation from the same.
- (c.) Grammar and analysis of sentences.

V.—Standard :

1st head.—Mathematics ;

- (a.) Arithmetic, complete.
- (b.) Euclid, 1st book, with simple deductions.
- (c.) Algebra, to simple equations.

2nd head.—English :

- (a.) Reading and explanation of the simple English Classics.
- (b.) Paraphrase.
- (c.) Grammar and analysis of sentences.

3rd head.—Vernacular :

- (a.) Translation from English into vernacular, or *vice versâ*.
- (b.) Paraphrase of vernacular poetry taken from ordinary school books.
- (c.) Vernacular grammar and idioms.

VI. Standard.—Matriculation :

N.B.—The examinations under the IVth and Vth Standards will be conducted in English.

For Vernacular Schools.

I.—Standard :

1st head.—Arithmetic, addition and the multiplication tables.

2nd head.—Writing syllables.

3rd head.—Reading 1st and 2nd books.

II.—Standard :

1st head.—Arithmetic, four simple rules.

2nd head :

(a.) Writing, simple words.

(b.) Reading and explanation of 3rd book.

III.—Standard :

1st head.—Arithmetic up to Rule of Three.

2nd head.—Writing to dictation from a senior school book

3rd head.—Reading and explanation of 4th book.

IV.—Standard :

1st head.—Arithmetic, complete.

2nd head.—Vernacular writing from dictation.

3rd head :

(a.) Reading current vernacular literature, including newspapers.

(b.) Paraphrasing vernacular poetry taken from ordinary school books.

4th head :

(a.) Vernacular grammar.

N.B.—Portuguese schools will be entitled to the same grants as vernacular and Anglo-vernacular schools. As regards these, the words “Portuguese” and “Anglo-Portuguese” may be read throughout the rules and schedules for vernacular and Anglo-vernacular.

SCHEDULE (B).

GRANTS TO PUPILS PASSED UNDER THE SEVERAL STANDARDS.

For European and Eurasian Schools.

The total grants obtainable under this schedule are greatly in excess of the amounts under the old schedule.

	First Head.	Second Head.	Third Head.	Fourth Head.	TOTAL.
	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
I.—Standard - - - -	5	5	- -	- -	10
II.—Standard - - - -	5	5	5	- -	15
III.—Standard - - - -	10	5	5	5	25
IV.—Standard - - - -	20	15	15	- -	50
V.—Standard - - - -	30	30	30	-	90
VI.—Standard (Matriculation) -	- -	- -	- -	- -	150

In addition to the above, in the case of girls, 5 rupees under the 2nd Standard, and 10 rupees under the 3rd Standard, may be awarded for good plain needle-work.

For Anglo-Vernacular Schools.

	First Head.	Second Head.	Third Head.	TOTAL.
	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
I.—Standard - - - - -	2	2	2	6
II.—Standard - - - - -	3	3	3	9
III.—Standard - - - - -	4	4	4	12
IV.—Standard - - - - -	7	7	7	21
V.—Standard - - - - -	10	10	10	30
VI.—Standard - - - - -	- -	- -	- -	100

The total grants obtainable under this schedule are greatly in excess of the amounts under the old schedule.

With capitation allowance of two rupees on the average attendance of pupils during the year.

For Vernacular Schools.

	First Head.	Second Head.	Third Head.	Fourth Head.	TOTAL.
	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
I.—Standard - - - - -	- -	- -	- -	- -	1
II.—Standard - - - - -	1	1	- -	- -	2
III.—Standard - - - - -	1	1	1	- -	3
IV.—Standard - - - - -	1	1	1	1	4

With capitation allowance of eight annas on the average attendance of pupils during the year.

N.B.—No capitation allowance will be granted to private schools admitted to aid under Rule XII. Nor will any school be entitled to capitation allowance as an Anglo-vernacular school which does not educate pupils up to the 3rd Anglo-vernacular Standard.

SCHEDULE (C).

FORM I.

For Schools under Recognized Management.

1.	2.	3.	4.	5.	6.
Locality.	Description of School.	Persons Responsible for its Management.	Average Annual Expenditure on Secular Education.	Probable Number of Pupils that will be Presented for Examination under each Standard at the Inspection or Matriculation Examination during the Year for which a Grant is Requested.	REMARKS.

from any school which may be for any considerable period unfavourably reported upon in this respect.

VII. In giving grants-in-aid, the following principles will be observed :—

(a.) The Government always endeavour so to give its aid that the effect shall not be the substitution of public for private expenditure, but the increase and improvement of education.

(b.) Grants will be given to those schools only, with the exception of normal schools and girls' schools, at which *some fee* is required from at least two-thirds of the scholars.

(c.) The Government grant will not in any case exceed the expenditure defrayed by contributions from private persons and *bodies*.

VIII. It is to be distinctly understood that grants-in-aid will be awarded only on the principle of perfect religious neutrality, and that no preference will be given to any school on the ground that any particular religious doctrines are taught, or not taught, therein.

IX. The Inspectors shall not make any inquiry in the course of their periodical inspection into the religious doctrines which may be taught at the schools, but will understand that their duty is strictly confined to matters concerning the secular purposes of the school.

GRANT-IN-AID RULES FOR THE CENTRAL PROVINCES.

(*Passed in March 1865.*)

PART A.—*Rules applicable to Schools for General Education.*

I. The local Government, at its discretion, and upon such conditions as may seem fit in each case (reference being had to the requirements of each district as compared with others, and to the funds at the disposal of Government), will grant aid in money, books, or otherwise, to any school in which a good secular education is given through the medium, either of English or the vernacular tongue, to males or females, or both, and which is under adequate local management.

II. In respect of any such school for which application for aid is made full information must be supplied on the following points :—

1stly. The pecuniary resources, permanent and temporary, on which the school will depend for support.

2ndly. The proposed average annual expenditure on the school.

3rdly. The estimated average number of pupils that will receive instruction, the ages of the pupils, and the average duration of their attendance at the school.

4thly. The persons responsible for the management and permanence of the school, and the time for which they will continue to be responsible.

5thly. The nature and course of instruction that will be imparted.

6thly. The number, names, and salaries of masters and mistresses, and subjects taught by each. (In the case of schools whose establishment is contingent upon the reception of a grant-in-aid, this information will be furnished so soon as the school is opened).

7thly. The books to be used in the several classes of the school.

8thly. The nature and amount of aid sought, and the purpose to which it is to be applied.

III. Any school to which aid may be given shall be at all times open to inspection and examination, together with all its current account and lists of establishment and scholars, by any officer appointed by the local administration for the purpose. Such inspection and examination shall have no reference to religious instruction, but only to secular education.

IV. The Government will not, in any manner, interfere with the actual management of a school thus aided, but will seek, upon the frequent reports of its inspectors, to judge from results, whether a good secular education is practically imparted or not, and it will withdraw its aid from any school which may be for any considerable period unfavourably reported upon in this respect.

V. In giving grants-in-aid, the Government will observe the following general principles: Grants-in-aid will be given to those schools only (with the exception of normal and female schools) at which *some fee*, however small, is required from the scholars; and wherever it is possible to do so, they will be appropriated to specific objects, according to the peculiar wants of each school and district.

VI. No grant will, in any case, exceed in amount the sum expended on the instruction from private sources, and the Government will always endeavour so to give its aid that the effect shall not be the substitution of public for private expenditure, but the increase and improvement of education.

VII. It is to be distinctly understood that grants-in-aid will be awarded only on the principle of perfect religious neutrality, and that no preference will be given to any school on the ground that any particular religious doctrines are taught or not taught therein.

VIII. When the inhabitants of any town desire to establish a department in connection with any zillah, or town school, for instruction in any science or language not included in the curriculum of study, and subscribe a certain sufficient sum for the establishment of such a department, then a grant not exceeding the sum expended from the above-mentioned source may be bestowed.

IX. One of the objects contemplated in Rule V. is the erection by private persons of suitable school-houses. With regard to the application for a building grant, the following rules are to be observed :—

i. The Inspector of schools must declare that he believes that there is a necessity for a school building in the locality proposed.

ii. A plan and estimate of the building must be approved of by the inspecting authority and the Director of Public Instruction.

iii. The site must also meet the approval of the Inspector.

iv. The amount contributed by the Government shall not exceed, nor in some cases equal, the amount contributed from private sources.

v. In the event of any building towards the erection, purchase, enlargement, or repair of which a grant may have been made by Government being subsequently diverted to any other than educational purposes, the Government shall have the option of purchasing the building at a valuation to be determined by arbitrators, credit being given for the amount of the grant which may have been made by Government.

NAME of the SCHOOL.	1. Pecuniary Sources on which the School depends.	2. Average Annual Expenditure on the School.	3. Average Number of Pupils Instructed, the Ages, and the Average Daily Attendance at the School.	4. The Persons responsible for the Management and Permanence of the School, and the Time they will continue so.	5. The Nature and Course of Instruction.	6. Number, Names, and Salaries of Teachers, and Subjects taught by each.	7. Books in Use in the several Classes of the School.	8. Amount of Aid sought for.	Remarks.

PART B.—Rules for Training Colleges.

I. Before a grant-in-aid for a training college can be given, the Director of Public Instruction must determine that such an institution is necessary for the district in which it is proposed to be established.

II. A normal school shall include—

1stly. A school for training adults.

2ndly. A practising department in which masters under training may learn to exercise their profession.

III. No grant shall be made to a normal school, unless the Director of Public Instruction is satisfied with the premises, management, and staff.

IV. To every adult of more than 18 years, and of good moral character, who shall sign a declaration that he intends *bonâ fide* to adopt and follow the profession of a schoolmaster, and that he will submit to the discipline of the school, and also shall pass an examination prescribed by the department, the sum of four rupees per mensem will be paid. This grant will continue for one year only; and should the schoolmaster infringe any of the conditions of his declaration, he will be required to repay to the State all the money that he has received

received, together with one rupee a month during the time he was in attendance for schooling fees. A clause to this effect will be inserted in the declaration.

V. As the demand for schoolmasters is limited, stipends will not be paid to more than 30 pupils at any one normal school.

VI. At the end of the year all the stipendiary pupils of the normal school will undergo an examination in the theory and practice of their profession, and in certain subjects to be prescribed by the Educational Department.

VII. For every man who shall pass the test prescribed for town schoolmasters, the normal schoolmasters shall receive the sum of 50 rupees; and for each of those who pass the test prescribed for village schoolmasters, 25 rupees shall be paid.

VIII. The normal schoolmasters shall receive no payment for any man who has been less than one year under instruction, and who shall not have attended school for at least 200 days.

IX. Grants-in-aid will be given to the practising school in the same manner, and on the same system, as to vernacular indigenous schools.

X. To enable normal schoolmasters to procure the necessary school furniture and educational apparatus, an advance of one-half of the outlay on these materials will be made. The advance will be adjusted at the end of one year.

XI. At normal schools where English is taught, and men are prepared for zillah schools, double the rates prescribed in Rule VII. shall be paid on the students under training passing the necessary examination.

XII. The State will, in every case, contribute one-half of the expense incurred on the erection of a training college, after an approved pattern—the building so erected being regarded as subject to the conditions specified in Section 5 of IX. of the Rules (A.) applicable to schools for general education.

XIII. Double the rates contained in paragraph 7 will be paid for trained schoolmistresses. Their subsistence allowance, whilst under instruction, will be the same as that allowed for men.

PART C.—*Rules for Indigenous Schools.*

I. To money provided locally for school buildings, furniture, &c., Government will add an equal sum—

(1.) Provided that building sites be approved of by the Deputy Commissioner.

(2.) Provided that the house be made over to Government, when the object for which the grant was made ceases to exist.

II. For each boy who passes an examination, according to the first or lowest standard, as noted at the end of these rules, the teachers shall receive payment at the rate of one anna per mensem—

(1.) Provided that the pupil is not more than 10 years of age.

III. For each boy who passes an examination according to the second standard, the teacher shall receive payment at the rate of two annas per mensem—

(1.) Provided that the pupil is not more than 12 years of age.

IV. For each boy who passes the examination prescribed by the third standard, the teacher shall receive payment at the rate of three annas per mensem.

V. For each boy who passes the examination prescribed in the fourth or highest standard, the teacher will receive payment at the rate of four annas per mensem.

VI. No teacher will receive payment for any boy who shall not have attended his school for a period of six months prior to the examination, and payment will be made for the period the boy may have been in the school.

VII. The same scale of payment will not be made for any boy for more than two successive years.

VIII. If a boy fails to pass all subjects of the accompanying tests, no allowance will be paid to the schoolmaster for the pupil so failing.

IX. The teacher shall keep a register of admittance according to prescribed form.

X. At the recommendation of the examiner, a portion of the total payment, and not exceeding one-fourth, will be given to the teacher in the shape of maps and books.

XI. On the first examination, after the promulgation of these Rules, payment will be made for the previous 12 months; but future payments will be calculated from the date of the former examinations. Such examinations will be annual.

XII. No master shall receive payment for more than 50 pupils, unless he keeps an assistant or pupil-teacher for every 25 boys above 50.

XIII. In the case of girls' schools, the payments mentioned in Rules II., III., IV. and V. will be doubled.

Revised Curriculum of Studies prescribed for the Examination of Scholars in Indigenous Schools.

	STANDARD I.	STANDARD II.	STANDARD III.	STANDARD IV.
Reading - - -	Easy narrative -	A paragraph from an elementary reading book used in a Government village school.	A few lines of prose or poetry from a reading book used in the first class of a Government village school.	A short ordinary paragraph in a newspaper or other modern narrative.
Writing - - -	Copy in manuscript character, a line of print.	A sentence slowly dictated once, by a few words at a time, from the same book, but not from the paragraph read.	A sentence slowly dictated once, by a few words at a time, from a reading book used in the first class of a Government village school.	Letter.
Arithmetic - -	Form, on black board or slate from dictation, figures up to 100; name at sight figures up to 100; add and subtract figures up to 100 orally from examples on black board, and the multiplication table up to 12.	A sum in any simple rule as far as short division (inclusive).	A sum in the four simple and compound rules as far as division.	A sum in rule-of-three, and in the four simple and compound rules.

GRANT-IN-AID RULES FOR BRITISH BURMAH.

(Passed in August 1864.)

THE Grant-in-Aid Rules for British Burmah are the same as those for Bengal, with the modifications indicated in the following letter from the Chief Commissioner of British Burmah, dated the 23rd July 1864.

"I have the honour to acknowledge the receipt of extract from the Proceedings of the Government of India, in the Home Department, No. 565, dated the 22nd of May last, together with copies of the various rules under which Grants-in-Aid are now made to schools.

"2. With reference to education in British Burmah, I beg to state that the revised rules, recently promulgated in Bengal, appear to me to be well adapted to British Burmah, with two exceptions. The exceptions are the rules noted in the margin. The reasons why I do not wish to include them in the rules for Grants-in-Aid to schools in British Burmah are as follow :

(b).—'Grants will be given to those schools only (with the exception of normal schools and girls' schools) at which fees of reasonable amount are required from the scholars.'

(c).—'For other schools in which the expenditure is more than 30 rupees per mensem, the Government grant will not, as a rule, exceed two-thirds of the income guaranteed from local sources.'

"3. Hitherto Grants-in-Aid have been made exclusively to schools established and supported by missionary societies at the towns and stations. But it is now proposed to extend the Grants-in-Aid to village schools. Now it will not be easy to establish regular fees in such schools. The parents of the scholars will support the master by presents in kind; but, if fees are rigidly to be established, I fear the usefulness of the Grants-in-Aid would be very much restricted.

"4. Further, I look forward to the time when the Buddhist monks, who instruct children in their monasteries as a part of their duty, will accept books on astronomy, European history, and other subjects to be used as a recognized portion of the course of instruction in their monasteries. Some Buddhist priests who have been educated in our schools have told me that they would have no objection to such a plan. But fees from scholars in such cases could not be expected, and no Grant-in-Aid could properly be accepted on such conditions. The children are instructed, as a matter of religious duty, according to the rules of the Buddhist monks when they take their vows. They depend for their support on the voluntary alms of their flock.

"5. Under the circumstances, I beg to request that his Excellency the Governor-General in Council will be pleased to allow me to adapt the revised rules for Bengal to British Burmah, with the modifications above mentioned. I may also add that the sixth heading of Rule II., as per margin, will have either to be modified, or to be applied in practice, with reference to the foregoing remarks."

'Sixthly.—The salaries of masters, &c.

APPENDIX (B).

RULES for the GRANT of AID to SCHOOLS for EUROPEAN and EURASIAN CHILDREN
—Commonly known as the Rules contained in "Lord Canning's Minute of October 1860."

STATEMENT by the BISHOP OF CALCUTTA on the subject of Schools for European and Eurasian Children in India (for Circulation in the United Kingdom).

Ravenswood, Simla, 30 July 1860.

CONSIDERING the interest which has lately been shown in every subject connected with India, and the general acknowledgment that Englishmen have no more pressing national duty than to promote the good of a people providentially committed to their trust, no apology is necessary for bringing to their notice one of the greatest wants of this country, especially as it is one which, from its simplicity, is very likely to be overlooked among enterprises of wider and more exciting importance.

Whatever may be our hopes of benefiting the natives of India by direct missionary efforts, by education, by good government, and by contact with European thought, it is quite certain that the conduct and character of the Christians settled among them must have the most direct influence on their estimate of Christianity and Western civilization. If a generation calling itself Christian, and descended wholly or partly from European parents, grow up in ignorance and evil habits, the effect on the heathen and Mahomedan population will be most disastrous.

But besides this obvious evil, it is nothing less than a national sin to neglect a class who are our fellow Christians and fellow subjects, whose presence in India is due entirely to our occupation of the country, but who, unless real efforts are made for their good, are in great moral and spiritual danger.

The class to which I refer consists of a large number of persons of European or mixed descent, some employed by Government in the Uncovenanted Service, others seeking a livelihood from some of the sources of profit which are now opening in the country, for whose children there are no adequate means of education: when these children are of wholly European origin, they could be properly reared in the plains, even though efficient schools existed there; when they are Eurasians, they would at least be much benefited in many ways by removal to the hills.

As my evidence on this subject may be undervalued, from my short residence in the country, I think it well, before I state what has been done, or what we are desirous to do for the education of such children, to cite the testimony of men of experience who have addressed, either to myself or to my chaplain, letters in answer to a circular which I lately issued on the subject. The following are extracts from these letters, all written by persons who have lived long in India, who are holding important situations under Government, and are well acquainted with these circumstances and wants of the class in question:—

I. *From the Commissioner of a Division in the North-Western Provinces.*—The question is, indeed, one of vital importance, and those who are thrown among the class of writers, and see boys and girls growing up among Native servants, in most cases picking up a very imperfect acquaintance with the English language, but too well instructed in things which it would be better if they never knew, have long felt the urgent necessity of providing them with schools. The great obstacle to the success of any local scheme in India is the absence of permanent residents, and therefore the want of a permanent foundation; we seldom have the same society for many months together. Those who are in a position to afford the largest pecuniary aid are generally approaching their period of retirement from the service, and the customary changes of appointment or promotion are perpetually breaking up the society in Indian stations. For this reason, I think that the comprehensive scheme proposed by the Bishop will meet with general support. The class of people who require most looking after are writers who receive on an average from 100 to 150 rupees per mensem. It is a very numerous body, and where there are several children, the cost of necessaries under the most economical management, will leave a very small margin for education, and, on the other hand, it is a great object to remove them from intercourse with natives, which is attained by the proposal to place the school in the Himalayas.

II. *From a Member of the Sudder Board.*—There are immense hindrances in the way of establishing an efficient and permanent school. Society is so flitting, and the resources and income of a school are so uncertain, that unless it be taken in hand by some permanent body, and has a main spring of existence beyond a local committee, it is vain to hope for the establishment of an efficient institution; meanwhile the young are "perishing for lack of knowledge." The Christian reader's scheme, originated by your Lordship when you were at Allahabad, promises to be useful for visiting and instructing the lower classes and the Europeans, &c., attached to the railway at Kuchpoorwa; but there is no school for their children, and, until such is available, we cannot but expect the rising generation to grow up careless, ignorant, and unchristian.

III. *From a Commissioner.*—It will give me very great pleasure to carry out, to the best of my ability, your Lordship's wishes, and I trust that the result of my inquiries may be in some degree equal to the importance of the object in view. At present, for want of some

institution of the kind contemplated, many of the sons of our uncovenanted officers are educated by Jesuits, not because the parents are hostile to our Church, but from absolute dearth of schools conducted on Church principles at a moderate cost. Your Lordship will probably find it necessary to have two schools, one accessible to the residents of the Cis- and Trans-Sutlej, and the other for the North-Western Provinces; and in each school it will, perhaps, be advisable to have higher and lower departments, under one principal, but at a different rate of yearly payment.

IV. *From the Principal of a Government College.*—I am extremely happy to hear of the movement which the Bishop is making to establish good schools for the children of European parents. That the want is a real one is apparent to all who have had much opportunity of being acquainted with boys brought up in this country. I confidently hope and believe that his Lordship's efforts will be largely responded to. Certainly few objects can be more worthy of the support of all Christian residents in India, and well-wishers of the country. Whilst so many direct efforts are made for Christianizing and improving the people around us, it is too often forgotten how enormously important, with reference to this work, is the indirect or unconscious influence of the resident Christian population, more powerful, perhaps, or rather, certainly, one way or other, than all the missionary labours in the country; and thus, for the sake of those around us, as well as for our own, whilst we urgently need for the present generation a large increase to the spiritual agency at work among the adult Christian residents, both the pre-ent and succeeding generations, Christian and heathen, will, under the blessing of God, reap the benefit of such schools as his Lordship has proposed.

V. *From a Chaplain in the Punjab.*—I return the Bishop's papers, and am sorry that but few have put down their names as able and willing to send their children to school. But this is not a proof of any indifference to the subject, for the want is so universally felt that few who could at all afford it would refuse to avail themselves of such an opportunity for the education of their boys. Several have withheld their names from the idea that it is a prospect too remote to be of much interest to them personally: but there is everything to encourage the Bishop in the good work, and many in this station would resort to such a school if once established.

VI. *From a Deputy Commissioner.*—Knowing that such a school is the crying want of India, as far as the clerks and that class of society are concerned, I warmly second the Bishop's project myself, and hope that he may be able to establish a good school in the hills, to the support of which I shall gladly contribute. There are several clerks here with families; their children are growing up; they can never hope to send them to England: and I do not know to what school they can send them in India. They would be glad enough to send them if a good and cheap school were established, but men of this class are unable to assist in carrying out such a project. As regards the rates of schooling, 10 rupees per mensem should be the lowest, and 30 rupees per mensem the highest.

VII. *From a Judge.*—Does the Bishop fully appreciate the slender means of the public on whose behalf he proposes the school? He must have an endowment, providing for a certain number of poor scholars annually; and I think that 10 per cent. of income is all that can be expected from a clerk for the education of one child, 15 per cent. for two, and 20 per cent. for three. The average income of people sending their children to such a school as is required in India would be under 200 rupees a month.

VIII. *From a Commissioner.*—As the seat of Government, Allahabad has drawn to itself the miscellaneous homeless Christian population whom the rebellion rendered dependent on the Government, or on charity; among these are widows and orphans of mixed blood, who in many cases speak Hindostanee only—a large and much neglected class. There are persons so ignorant of the first principles of Christianity (though nominally Christians) as to be utterly unable to teach their children. There are no schools for them; no one has time to do more than relieve their temporal wants, and the consequence is that many lapse into Mahomedanism, or lead lives which shock the professors of any religious belief. We are utterly helpless as to dealing with this evil; many cases have come under my notice in consequence of applications for pensions when husbands and fathers were killed during the mutiny, in which whole families of children, unable to speak a word of English, and utterly uneducated, growing up in the city among Mahomedans and idolators, are learning all that is bad. The probable future of the girls especially is painful to contemplate.

IX. *From the Director of Public Instruction in the Punjab.*—The object should be to found schools in the Himalayas for the children of European and Eurasian residents in India of the poorer classes. If for 10 rupees or 15 rupees a month a child could be boarded, clothed, and really well educated at a good school in the hills, where he would live in a healthy instead of a debilitating climate, and would at all times associate with boys of his own class, instead of running wild among natives of the lowest order, where he would be brought up in a healthy moral atmosphere, and freed from the many pernicious influences which would be acting on his youthful mind elsewhere, I cannot imagine that there would be any lack of candidates for admission. In founding such a school we could not do better than take that admirable institution, the Lawrence Asylum at Sunawur for our model. It provides for the care and education of 500 children of soldiers, and what is now wanted is just such another asylum for the children of the poorer non-military classes. And by means

means of Government aid and private liberality, I should hope that the cost to the parents of each child at such an institution might be reduced to sums varying from 10 rupees to 15 rupees a month, according to circumstances. The prime object must be to raise by private donations and subscriptions the requisite funds for buildings capable of accommodating say 100 children, for with that number the experiment can be fairly made, and it will soon be evident how far the success attending it warrants its further extension. Considering that the object in view is directly to aid the hard-working classes of Government servants in educating their families, and indirectly to raise up a most efficient body of candidates for subordinate Government employ, it is pretty certain that Government aid will not be withheld; and if the nature of the school be once clearly defined, and the really useful and benevolent aim of its promoters be only properly understood, there seems every prospect of the project meeting with liberal support from the English public both in India and at home.

To these testimonies I may add an extract from the Report of the Select Committee on European Settlement and Colonisation in India, ordered by the House of Commons to be printed, 9th August 1859 :—

“It has been suggested that asylums, like those founded by the lamented Sir Henry Lawrence, might be advantageously formed on the hills, where, in a climate like that of our own country, children might be trained with a special view to the practical improvement of India, and to the acquisition of a knowledge of the people and the country. Mechanics and practical agriculturists are much wanted in India. The planters state that young men acquainted with the Native languages are much required for their establishments. Thus educated, they might also be employed for extending the commerce and manufactures of Great Britain and Europe in the East.”

The above extracts are quoted as going more or less into detail, but they are a very small number of the expressions of sympathy and promise of co-operation which I have received, either in writing or conversation, from persons whose judgment is of the greatest value. They are all from the letters of Government officers in the Punjaub or North-West; for although I have been strongly urged to try to establish a school for Bengal at Darjeeling, yet, as there are good schools in Calcutta, I thought that this object, however desirable, might be postponed till the wants of the Upper Provinces were to some degree supplied. The extracts prove three points in particular—(1) that the want of education is most real and pressing; (2) that it can only be supplied by the munificence of those who care for India; and (3) that there is abundance of secular employment open for well-educated persons in this country, while we might hope that some trained in a good school in the hills, and transferred in early manhood to the foundation of Bishop's College, might, in their turn, by God's blessing, become useful as schoolmasters and as ministers of the Anglo-Indian Church.

The want, to the reality of which such ample testimony is borne, was first brought to my notice before I arrived in my diocese, by letters from some of my clergy. It appeared that a proposal had been set on foot in 1857 by Mr. McLeod, the Financial Commissioner of the Punjaub, for the establishment of a school at Lahore, and active steps were being taken for this object when the mutiny broke out, and the scheme was necessarily suspended; the very small amount of subscriptions actually collected for this school was subsequently handed over to me for a school in the hills.

Before the day of general thanksgiving for the suppression of the mutinies, 23rd July 1859, I issued a pastoral letter to the clergy of the diocese, proposing that a collection should be made in all English congregations on that day for the foundation of a public school at some station in the Himalayas, as a thank offering to Almighty God and permanent memorial of the great deliverance then commemorated. Accordingly a general collection was made, amounting to a total of rupees 35,000, including a munificent donation of rupees 10,000 from his Excellency the Viceroy, who has kindly expressed to me his warm interest in the scheme, to the collection, at the cathedral, Calcutta. This money has been invested in 5½ per cent. Government Securities in the name of the Bishop and Archdeacon of Calcutta for the time being, and is called the Indian Public Schools Fund. At the same time a great number of letters were sent to me promising support and donations as soon as a definite scheme should be drawn up and placed before the public. As soon, therefore, as the site of the school is fixed, I hope to send out another appeal for subscriptions in India.

When I arrived at Simla, after the incessant occupations of my visitation tour in the North-West and the Punjab, I at once turned my attention to the subject, and issued another circular to the civil authorities of these provinces, requesting information as to the rate of payment for schooling which could generally be expected from persons for whose benefit the scheme was intended, and a number of papers were kindly circulated in the different stations by the magistrates and deputy commissioners among the clerks and other residents. A few of these have put down their names as able to afford sums which would nearly defray the cost of a boy's board and education.* But the rates of payment generally mentioned are, 15, 12, 10, or even 6 rupees per mensem, and a large number have declined entering their names at all, either from attaching little value to the systematic education of their children, or from inability to pledge themselves on the subject.

From

* From such information as I can collect, a boy's board and education at Simla or Mussoorie in a school of 60 boys would cost from 30 rupees to 35 rupees per mensem. This would diminish as the number of boys increased.

From the facts and suggestions now collected, I think that the course of action which ought to be pursued, in hopes of gradually remedying the great and crying evil with which we have to deal, is tolerably plain—

First, we must endeavour to found one school at a central station in the Himalayas, probably either Simla or Mussoorie, with buildings and endowments provided by private liberality, and assisted, we may hope, by a Government Grant-in-aid,* so as to receive a certain number of children at a low rate of payment. The necessary school buildings must be erected entirely by donations, and the institution, in accordance with my pastoral letter to the clergy, will be directly connected with the thanksgiving day, and dedicated to God's service as a thank-offering for His mercy, by the erection of a chapel for the use of the scholars within the school precincts, in which the circumstances of its foundation will be recorded. The school should be placed under the direction of a small body of governors, partly official and partly elected. Among the official governors would be the Lieutenant-Governor, the Bishop and Archdeacon of Calcutta, and the Commissioner of the division. Should the Punjab or north-west be separated from the diocese of Calcutta, the Archdeacon would yield his seat among the governors to the bishop of the new see, the Bishop of Calcutta retaining his as Metropolitan of India. As soon as possible a girl's department should be added to the institution, as is the case in the Lawrence Asylum at Sunawur, and the whole should be placed under the care of a clergyman of the Church of England as principal. The education, of course should be as comprehensive as possible, with due reference to the wants and circumstances of the class for whose benefit the school is especially designed, viz., the uncovenanted servants of Government receiving small salaries, and others who cannot send their children to Europe.

Secondly, it will afterwards be desirable to found day schools of a humbler kind for the children of Christian residents in the great cities in the plains, for it is evident from some of the extracts above quoted, especially II. and VIII., that a hill school would not do all that is immediately required for the lowest and poorest class of Eurasians. Local efforts are now making to establish such schools at two of the largest cities in the Punjab, and the wants of Lucknow would be amply supplied by the noble Martinière, if a girl's department were added to the boys' school there. But these schools could be maintained at a comparatively small cost, and probably a Diocesan Education Society would suffice for the purpose, to give stability and encouragement to attempts made in the cities themselves. From these schools, by means of scholarships, promising scholars could be drafted to the central Institution in the hills.

Thirdly, it is hoped that hereafter other schools might be founded at hill stations at two extremities of our empire; at Darjeeling probably and Muree, just as the Lawrence Asylums at Ootacamund, Muree, and Mount Aboo, are the daughters of Sir Henry's parent foundation at Sunawur.

But the second and third parts of the scheme need not yet be submitted to the public. At present our object is, with the aid of the nucleus already contributed on the thanksgiving day, to found one school as a beginning, to be at once a memorial of our great deliverance, and an earnest that by God's blessing we will try henceforth to train up in India children who shall be living members of Christ's Church, and fitted to do their duty both to Him and their country.

It may no doubt, be said in England that Europeans in India are numerous enough and rich enough to found such an Institution by their own unaided efforts; but it may be remembered that India is not a colony, almost independent of the mother country, which English settlers make their permanent home, but a province of the British empire, in which all Englishmen are as directly interested as those who are sent out for a time to administer the Government; that many in England owe as much to India personally, and are as closely connected with it as those who are actually living and working there; that the wealthier classes in this country are exposed to most heavy expenses for the education of their own children in England; and that in these days of high prices, financial deficits, and new taxes, their means are not what they were; and that the class for whom the school is specially designed are unable to pay the whole cost of their children's education at it, much less to contribute to its endowment. While, therefore, the obligation which rests upon us in India to do our utmost to help them is not denied, and will not be evaded, it is not unreasonable to hope that as aid has always been forthcoming in England for other India objects, it will not be refused for this, certainly not among the least pressing or important.

Donations for this object may be paid to

Any person or religious society contributing 200*l.* might, if he pleases, direct it to be invested for the foundation of a scholarship, reducing the school expenses by 10*l.* per annum. A donation of 300*l.* would found one of 15*l.* a year, and so on. Smaller donations may be made either to the building or to the endowment fund, or to be given generally, without specifying either, to be used for whichever object stands most in need of help.

G. E. L., Calcutta.

* No promise of this has been given, nor can any be asked till the plan has assumed a more definite shape.

MINUTE by the Governor General, dated the 29th October, 1860.

I RECEIVED the accompanying paper from the Bishop of Calcutta in August last. It has been sent by his Lordship to England for circulation, and has probably reached the hands of the Secretary of State for India. It will be well that, without waiting for any reference from the home Government, the Government of India should give its opinion of the Bishop's scheme; for, if action is to be taken upon it by the Government, the sooner this is declared the better.

Schools for European and Eurasian children in the hills.

2. Of the want of some more extended and effectual means of education than at present exist for European and Eurasian children there can be no doubt. The necessity is shown in the extracts from letters quoted in the Bishop's statement, and it meets the eye of the traveller at almost every station, from Calcutta to Peshawur. Moreover, it is a necessity which is rapidly growing stronger. Besides the ordinary rate of increase in Eurasian births and in the births of European children in India (whatever that may be, for there are no means of ascertaining it accurately), there is the fact that the influx of Europeans into India is gradually becoming larger; and that with the augmentation of our English army and with the advancement of works of English enterprise, the births of English children, and of children of mixed marriages in India cannot fail to be enormously increased.

3. If measures for educating these children are not promptly and vigorously encouraged and aided by the Government, we shall soon find ourselves embarrassed in all large towns and stations with a floating population of Indianized English, loosely brought up and exhibiting most of the worst qualities of both races; whilst the Eurasian population, already so numerous, that the means of education offered to it are quite inadequate, will increase more rapidly than ever.

4. I can hardly imagine a more profitless unmanageable community than one so composed. It might be long before it would grow to what could be called a class dangerous to the State; but a very few years will make it, if neglected, a glaring reproach to the Government, and to the faith which it will, however ignorant and vicious, nominally profess. On the other hand, if cared for betimes, it will become a source of strength to British rule, and of usefulness to India.

5. The Eurasian class have an especial claim upon us. The presence of a British Government has called them into being; they serve the Government in many respects more efficiently than the natives can as yet serve it, and more cheaply and conveniently than Europeans can do so: and they are a class which, whilst it draws little or no support from its connection with England, is without that deep root in and hold of the soil of India from which our native public servants, through their families and relatives, derive advantage.

6. But the Government of India cannot undertake to provide education for either Europeans or Eurasians. It has other things to do, and it would not do that work well.

7. The missionaries cannot do it. Their task lies with those who are not Christians.

8. To wait till private enterprise shall supply schools of the kind required will be to wait indefinitely. It is only in very exceptional instances that teachers of good character and training will bring their talents to so uncertain and, in many respects, so discouraging a field of labour; and meanwhile, the evils of a dearth of education will be growing upon us. Moreover, no system sufficiently comprehensive and widely spread to meet our necessities can rest on the isolated efforts of individuals alone.

9. Therefore the case seems to be exactly one in which a system such as has been proposed by the Metropolitan of India may fitly be encouraged and aided liberally by the Government. It may be hoped that it will be supported by the British public in India and in England; but the principle of self-support should be carefully kept in view, to the fullest extent to which it may be attainable.

10. The scheme proposed by the Bishop of Calcutta in the accompanying paper is, so far as it goes, a thoroughly sound and practicable one. I say so far as it goes, because it does not profess to supply the wants of those Christian children who are not of the Church of England, and because, even as regards children who are of that church, or whose parents are willing to accept for them the teaching of the Church of England, it will not, as I understand, put education within the reach of the poorer of them until those whose families are more at ease shall have been provided with it.

11. His Lordship contemplates the establishment in the plains of schools of a humbler and cheaper class than those in the hills; but it is proposed that the former shall be day schools only, and that they shall be treated as a future and subsidiary step in the scheme.

12. I am strongly of opinion that schools in the plains should be provided as soon, at least, as schools in the hills. The expense of education at a hill school must, at the lowest, be beyond the means of a vast number of Eurasian families settled at the great provincial stations. The climate of the hills is not a necessity to Eurasian children; indeed it is held to be injurious to them, if at all weakly. A school of a lower class than that proposed for

the hills could, if placed at a well-chosen station in the plains, receive the day scholars of that station, and boarders from many other stations, on terms not too high for the earnings of their parents. I believe that the cost to boarders at such a school could be brought down to less than 10 rupees a month. Such a school might receive a European as well as Eurasian children; for, although the advantage of a hill climate would be wanting, the children would not be worse off in this respect than at their homes, where they would remain if the alternative of sending them to a hill school should be too expensive, which, in the cases of some European parents, it certainly would be. It would be an excellent measure to attach to such a school scholarships which should enable the boys obtaining them to continue their education at the higher class schools in the hills. But in any case I should be sorry to see the humbler and cheaper schools in the plains postponed to those in the hills. The error into which (as will be seen in the opinions quoted by the Bishop) we are most likely to fall, is that of constructing a scheme above the reach of those whom it is most necessary to benefit; and this being so, we ought not to begin to construct from the top only.

13. The suggestion that mechanics, the industrial arts, the practical horticulture and agriculture should be taught is very judicious. All of these may be taught in the climate of the hills, and much of them in that of the plains. Hitherto education has done little more for the Eurasians, than to turn them into clerks and copying machines.

14. I concur in the Bi-hop's opinion, that the first schools should be established in the North-western Provinces of the Punjab; and that the claims of Lower Bengal may be considered later.

15. As to the form and extent of the aid to be given by the Government of India, I recommend that it be as follows:—

That to the sum collected from private subscriptions as a building and foundation fund, an equal sum be added by the Government.

That from the opening of each school, it should receive a grant-in-aid to the fullest extent allowed by the rules.

That if the school be built where ground is at the disposal of Government, the ground be given.

That the head master of the school, if a clergyman, be placed on the footing of a Government chaplain in regard to pension.*

16. Other unforeseen modes of aid may prove advisable; but these appear to me to be all that can be pre-scribed beforehand.

17. In regard to the management of the schools, I have nothing to add to the bishop's proposal. If, as his Lordship suggests, certain Government officers be included, *ex-officio*, amongst the governors, I should not wish to see any further authority by the Government, as such, exercised in the management. Of course, as receiving a grant-in-aid, the schools would be subject to inspection by Government officers of the Educational Department.

18. I have said that the scheme does not profess to supply the wants of Christian children who are not of the Church of England. I did not mean to impute thereby any fault to the scheme. It is right and prudent that, in this case, nothing more should be aimed at than to meet those wants.

19. Recently, in the case of the new Lawrence asylum in the Neilgherries, the Government of India insisted, as a condition of its support, that the rules should be such as should admit Roman Catholic and other Christian children, as well as children of the Church of England. But that was the case of a charitable institution, founded for the children of soldiers, who are habitually taught in the same regimental schools without distinction of church, and dedicated to the memory of Sir Henry Lawrence, from whose large and generous views, as shown in the constitution of the original Lawrence asylum in the Himalayas, any departure would have been unpardonable.

20. The schools now contemplated are not charitable institutions; they are designed for the use of a class, the families composing which can supply abundance of scholars for the Church of England, and which, for the most part, would not willingly pay for the teaching of a school which was not essentially of that church. I have no doubt that an attempt to accommodate such schools to the teaching of children of all churches would lead to its failure.

21. But though the proposal of the Bishop goes to the full length which, in the circumstances described, as desirable, I am of opinion that the Government of India cannot with justice limit its support to these schools alone. The very large number of Eurasian Roman Catholics scattered through the Upper Provinces, and employed under the Government, and the not inconsiderable number of Presbyterians settled in the country, have their claims upon this Government as well as the members of the Church of England.

* Judging from the sum already collected by the Bishop in India, and in expectation of the success which, it may be hoped, will attend his lordship's appeal to England, these aids would probably suffice for the establishment of one school of the higher class in the hills, and one in the plains, of a lower class, but affiliated to it.

22. I recommend, therefore, that, besides grants-in-aid (which under certain rules may be claimed by any schools) assistance in the same form, and in the same proportion as have been proposed for the Church of England school, should be extended to any Roman Catholic or Presbyterian school which, with the same view, may be founded in the hills, and to any school of a lower class, connected with it which may be newly established in the plains.

23. I have written of schools to be established in Bengal only, because the Bishop's scheme applies only to Bengal and to the Himalayas. But if a scheme similar to that which his Lordship has proposed should be originated in Madras or Bombay, I recommend that the Government take the same part in supporting and executing it. I do not, however, think it advisable that such a scheme should emanate from the Government.

(signed) *Canning.*

DESPATCH to the Secretary of State, No. 24, dated 3rd November 1860.

IN the 23rd paragraph of the bishop's Annual Report, which was transmitted to you with our letter in the Ecclesiastical Department, No. 8, dated the 2nd of August, allusion was made to a design entertained by his Lordship of establishing a school in the hills for European and Eurasian boys, the children of clerks and others, whether employed in the service of Government or otherwise, and in the 10th paragraph of our reply, dated the 2nd idem (forwarded with the same letter), we intimated to his Lordship our cordial concurrence in the project.

2. We have now the honour to transmit, for your consideration, the enclosed copy of a statement by the Bishop, submitting a scheme for the establishment of such a school either at Simla or Mussoorie, with the Minutes which we have recorded upon it. We trust that the views which are expressed in the Governor General's Minute, as to the part to be taken by Government in promoting the general object which the Bishop has at heart, will meet with your approval.

DESPATCH from the Secretary of State, No. 3, dated 16 January 1861.

I HAVE considered in Council your letter dated 3rd November (No. 24) 1860, on the subject of a design entertained by the Bishop of Calcutta, for the establishment of a boarding school in the hills, and of day-schools at the several stations in the plains, for the children of Europeans and Eurasians of limited means, whether in the service of Government or otherwise.

2. I entirely concur in the sentiments expressed by the Bishop and your Government as to the great and increasing importance of some systematic measures being adopted for promoting the education of this class of children, and I agree with you that the object is one well deserving the encouragement and assistance of Government.

3. I entertain no doubt of the great advantage to be expected from the establishment of the proposed institution in the hills, in which the European and Eurasian children of the non-military classes will enjoy the benefits which have already been extended to the children of soldiers of European origin in the Lawrence Asylums; and, with the exception of the proposal as to the head master's pension, I approve the manner in which you propose that the assistance of Government shall be afforded to the institution. If it is intended that the pension of the head master, "on the footing of a Government chaplain," shall be paid by Government, I cannot sanction the proposal, a similar recommendation regarding the Principal of the Lawrence Asylum having already been negatived, although that institution, unlike the proposed school, has been formally taken over as a Government institution.

4. I concur in your remarks as to the inexpediency of delaying the formation of the proposed small station schools in the plains; and the suggested establishment of a central school in the plains, of a lower order than that proposed for the hills, will no doubt receive every consideration from the Bishop and those associated with him in this laudable undertaking.

5. I approve the intention expressed in the concluding paragraphs of the Minute of the Governor General, as to the assistance to be given to schools for the children (when they are sufficiently numerous) of those Europeans and Eurasians who are not members of the Church of England; and I agree with his Lordship that, if any measures are taken in the Madras and Bombay Presidencies for establishing schools for European and Eurasian children, the same support and assistance should be rendered to the movement as has been sanctioned for Bengal.

C. Wood.

COPY of REPORT by Sir *A. Grant*, Director
Public Instruction at *Bombay*, on the No.
Mr. *A. Monteath*, on the State of EDUCATION
India.

(*Sir Stafford Northcote.*)

Ordered, by The House of Commons, to be Printed
4 May 1868.

[*Price 1 s. 6 d.*]

TELEGRAPHIC COMMUNICATIONS (EAST INDIA).

RETURN to an Address of the Honourable The House of Commons,
dated 13 May 1868;—for,

“ COPY of Two MEMORIALS to the Governor General from the Commercial
Communities of *Calcutta* and *Bombay*, on the Subject of TELEGRAPHIC
COMMUNICATIONS, together with other DESPATCHES and PAPERS on
the same Subject.”

India Office, }
13 May 1868. }

W. T. THORNTON,
Secretary, Public Works Department.

(*Sir Stafford Northcote.*)

Ordered, by The House of Commons, to be Printed,
14 May 1868.

COPY of Two MEMORIALS to the Governor General from the Commercial Communities of *Calcutta* and *Bombay*, on the Subject of TELEGRAPHIC COMMUNICATIONS, together with other DESPATCHES and PAPERS on the same Subject.

(No. 8 of 1868.—Government of India.—Foreign Department.)

ELECTRIC TELEGRAPH.

To Her Majesty's Secretary of State for India.

Sir,

Fort William, 15 February 1868.

WE have the honour to transmit copy of a memorial presented to the Viceroy by the European mercantile community of *Calcutta*, urging the insufficiency of the existing telegraphic communication between England and India, *viâ* Persia and Constantinople, and recommending the concession of Government assistance to a project for a telegraphic line, *viâ* Egypt and Aden, and thence by submarine telegraph to *Bombay*.

2. We bear in recollection that the failure of the Red Sea telegraph line, which was constructed, as we believe, by a company on a joint guarantee of interest by the Home Government and the Government of India, involved, and still involves, a loss to the State in the payment of interest; and this consideration perhaps renders any renewal of the attempt more difficult than it would otherwise have been.

3. It is also to be remembered that telegraphic communication has now been established by the other route, that is, by Persia, which was altogether at the cost of India. And there seems reason to believe that the proceeds of the existing line, and the total income derived from the communication, will not much more than suffice to pay for that line alone. Thus from this point of view there probably will not be sufficient income from the telegraphic communication between England and India, to pay for two lines.

4. On the other hand, the question of providing a second or alternative line between England and India, is of great and growing importance. It will be seen from the memorial now forwarded that complaint is made of imperfections in the messages by the Persian line, which passes through countries altogether out of British jurisdiction, and having several varieties of race and language. And certainly we apprehend that there is something of precariousness about the Persian line; and that circumstances might, at any moment, arise, to cause either a temporary suspension or a more lengthened interruption of that communication. From every point of view then, whether political, or commercial, the provision of an alternate line becomes important. And any line by the Red Sea is more under our control and protection, and therefore more reliable and permanent, than any line through Persia could be.

5. Questions relating to the second line by the Red Sea, have for some time past been under the consideration of the Government of India; as will appear from the present correspondence as well as that already* transmitted, and of which, for facility of reference, a summary is included in this despatch.

6. There is information that the Viceroy of Egypt is advancing telegraph lines up the valley of the Nile, and is prepared to carry them across to the Egyptian

* *Vide* telegraph despatches from the Home Department:—No. 21, dated 4th May 1866; No. 28, dated 23rd June 1866; and No. 19, dated 26th July 1867.

Egyptian ports on the western coasts of the Red Sea, as far down that sea as possible, so as to meet any line that may be constructed from India. In this way the line might be continued without much of submarine telegraph to Aden.

7. From Aden it could be taken along the southern coast of Arabia and round the south-west corner of that coast up to Muscat and on to Cape Mussendom. There it would cross the narrow straits of the Gulf over to the Persian shore; where it would join the existing line between Kurrachee and the Gulf. Then the combined lines would pass along the Mekran coast to Kurrachee.

8. If these projects be entertained in whole or in part by Her Majesty's Government, we presume that a competent professional survey would be undertaken as an essential preliminary.

9. Again there is an alternative proposal for the line between Aden and Bombay, under which the wires would be taken to the Island of Socotra, off the east coast of Africa; and thence, by one long stretch of submarine telegraph, straight across to Bombay. This route seems to be the most direct one; and perhaps there would be *some* saving of distance. But whether this route is preferable, or even practicable at all, is a question of telegraphy, and especially of submarine telegraphy, on which we need offer no opinion, as the best possible information would be available in England.

10. We are inclined to believe that, so far as practicability is concerned, the failure of the first trial by the Red Sea need not preclude a renewal of the attempt, if that, on other grounds, were deemed desirable. For that failure probably arose from errors, scientific or practical, in the execution of the work, which were perhaps more or less inevitable in the then stage of telegraphy, but which in the present time would be readily avoided.

11. If Her Majesty's Government were now to be in favour of constructing an alternative line by the Red Sea, we should not recommend that the work be entrusted to a guaranteed company. Rather than adopt that course, we would prefer that the line were constructed through the direct agency of Government, believing that by these means the work would be done much more economically than by a private company. This too would be suitable in reference to the consideration that a Red Sea line would be in direct competition with the Government Anglo-Indian line by Persia. Or if there were valid objections to this being made a Government undertaking, then a subvention of a fixed sum per annum might be conceded to a private company. In any case we would recommend that the cost to the State be divided equally between the British Government and the Indian Government.

12. In conclusion, we observe in reference to paragraph nine of the memorial, that no despatch from Her Majesty's Government regarding a guarantee to a private company has reached us.

We have, &c.
(signed) *John Lawrence.*
W. R. Mansfield.
G. N. Taylor.
W. Massey.
H. M. Durand.
W. Muir.
H. S. Maine.

TELEGRAPHIC COMMUNICATION BETWEEN GUADUR AND FAO.

(No. 27.)

From Colonel *W. F. Marriott*, Secretary to Government, Bombay, Indo-European Telegraph Department, to the Secretary to the Government of India, Home Department, —No. 241; dated the 19th November 1867.

I HAVE the honour to acknowledge the receipt of your letter, No. 2,614, of 22nd July last, on the subject of lines of telegraph alternative to the submarine line between Guadur and Fao.

2. As respects the continuance of a land line from Guadur along the coast, so far as practicable, and the probable cost thereof, I am desired to refer to the 12th and following paragraphs of a letter from Mr. Walton (Director of the Submarine Line), No. 839, of 3rd September, accompanying, in which he gives an estimate of the total cost of extending the land line from Guadur to Bundar Abbas, amounting to 6,23,000 rupees. It is proposed henceforward to consider this question in connection rather with the transfer of the telegraph station from Mussendom to Angaum; and I shall have the honour to report further after the arrival of Colonel Goldsmid, who is expected from England to superintend that transfer.

3. In regard to the suggested line through the Wahhabee country, I am desired to submit the accompanying copy of a letter from Colonel Pelly, the resident at Bushire, No. 118, of 17th September, which appears to His Excellency in Council conclusive against that line.

4. With respect to a submarine line, *viâ* Aden, to meet the Egyptian Red Sea land line, I am desired to invite attention to the first part of Mr. Walton's letter, No. 839, above mentioned, and to his further letters, No. 847, of 4th September, and No. 896, of 24th September, the latter being accompanied by a letter from Lieutenant Stiffe (the engineer of the submarine cable), No. 168, of 4th September, and a chart.

5. His Excellency in Council thinks that the line from Jask by the Arabian coast is shown to be preferable to a direct line from Bombay. The work of removing from Mussendom to Angaum will occupy, during the ensuing season, both the steamer "*Amberwitch*" and the officers of the department; whilst the pressing needs of the Abyssinian expedition prevent the allotment of another vessel for survey purposes. His Excellency in Council therefore recommends that the survey of the proposed line and the preparation of estimates of cost be regarded as a duty to be undertaken so soon as the completion of the Angaum transfer and other necessary facilities shall permit.

(No. 28.)

From the Director, Mekran Coast and Submarine Telegraph, to the Secretary to the Government, Bombay,—No. 839; dated Kurrachee, the 3rd September 1867.

I HAVE the honour to furnish the information called for in Government Resolution, No 192, dated 21st ultimo, regarding the preliminaries for connecting Bombay and Aden by submarine telegraph, and at the same time to submit an estimate for the extension of the aerial line along the Mekran coast from Guadur to Bunder Abbas.

2. To connect Bombay with Aden *direct* is, in my opinion, in the present state of the science, a speculative venture, which I am not justified in recommending to Government for adoption, *first*, on account of the excessive depth, known to exceed 2,000 fathoms; *secondly*, no such venture has yet been demonstrated as practicable; and *thirdly*, the risk is not only very great, but quite unnecessary.

3. With regard to the depth, all we know at present is, that from the 100 fathoms mark the sea suddenly deepens to over a thousand fathoms, and beyond this has not yet been surveyed in detail, a course which is indispensably necessary before a cable can be properly laid; but from occasional soundings it is known that the average depth exceeds 2,000 fathoms.

4. The only attempts at deep sea telegraphy over any great distance have been the Red Sea and Atlantic cables; the former scheme was a total failure, and the other is on its trial. A great deal has been made of the fact that the end of the 1865 cable was picked up in something like 2,000 fathoms; but picking up a lost end is only a comparatively small process to that of repairing a *broken* cable in 2,000 fathoms, an operation which has not yet been performed, involving, as it does, the picking up of two ends and buoying the cable end in such an enormous depth of water, while the splice is made and the bad portions of cable cut out, then paying out and picking up the buoyed end and making another splice. It is, I believe, a fact that the 1866 cable was reported broken on the 20th July last, but we have not yet heard of communication being restored, although the Chairman of the Atlantic Telegraph Company wrote to the "*Times*" on the 22nd July, stating that the fault was only 50 miles from the American terminus in a very moderate depth of water, and that the cable could be repaired with great facility.

5. But the risk of crossing from Bombay to Aden *direct* is quite unnecessary, for Government have already a submarine line to Cape Jask on the Mekran coast, and the distance thence to Aden is less than 1,400 miles in moderate depths of water, whereas the direct route in extreme depths is 1,660 miles, or *viâ* Kooria Moorias Islands, 1,700 miles. Moreover, the speed of working through an excessive length of cable is such as to limit the traffic to comparatively few messages, and necessitating the use of delicately sensitive instruments, while the route, *viâ* Jask, Muscat, and Kooria Moorias, will be divided into sections of moderate lengths, over which traffic can be conducted with great rapidity, and with the use of the usual strong and serviceable recording instruments.

6. I am not aware that it has been proposed that Government should adopt the direct route, but I believe that such a course is under consideration by a private company. I would, however, respectfully beg to urge the advantages that will accrue by adopting the route I suggest, *viz.* :

	Miles.
From Jask to Muscat - - - - -	136
„ Muscat to Hallain (Kooria Moorias) - - - - -	486
„ Hallain to Aden - - - - -	718

By direct course - - 1,340

or by cable route, and allowing for slack, the lengths will be--

	Statute Miles.
Jask to Muscat - - - - -	350
Muscat to Hallain - - - - -	560
Hallain to Aden - - - - -	825

Miles of Cable - - 1,635

The direct route would require between 1,800 and 1,900 miles of cable.

7. The whole distance from Jask to Aden the cable can be laid in moderate depths of water averaging from 60 to 100 fathoms, and nowhere exceeding 300 fathoms; repairs could therefore be readily effected in all weathers. I have, however, requested Lieutenant Stiffe to report on this subject, and he is now engaged in preparing a chart of this route. In anticipation of the cable being eventually laid as now proposed by me, the Arabian coast from Aden to Muscat requires carefully surveying, not only to ascertain the depth of water, but more especially *the nature of the bottom*.

8. The sounding gear that was used by Captain Chitty, in the "*Victoria*," some years ago, is, no doubt, still serviceable, and the survey could, I imagine, be easily completed during the coming season from October to April if a steamer could be placed at the disposal of a competent officer. The steamer should consume a minimum amount of coal, and be capable of carrying at least 20 days' fuel in her bunkers and hold, otherwise great loss of time and heavy expense will be incurred by her constantly running back to port for fuel.

9. The distance from Aden to Perim is, by cable route, about 100 miles, and thence to Mussowa about 340 miles more. Should the Egyptian Government aerial line extend so far, we should have an alternative line to Europe *via* Alexandria without incurring the risk of laying a cable along the volcanic and coral bottom of the Red Sea.

10. The cost of manufacturing and laying the cable from Jask to Aden will be heavy, but the maintenance of the line will cost but little. The stations at Muscat, Hallain, and Aden would each cost under 2,000 rupees (two thousand) per mensem, and the repairs of the cable, if required, would be effected by the "*Amberwitch*," at but very slight increase to her present working expenses. In fact, now that Government have an efficient telegraph establishment, with officials who are practised in submarine telegraphy, a steamer fitted for the purpose of laying and repairing cables, and the instruments required for the work, the extra expense of working a line to Aden and Bombay would be almost nominal after the additional cable is once manufactured and laid.

11. However perfect the telegraphic system may be (and it is quickly becoming so) between Kurrachee and Great Britain, the Government and people of India cannot reap the full benefit of it until the communication between Kurrachee and Bombay is placed on a more secure footing. In my letter, No. 1093, dated 23rd October 1866, I had the honour to submit a scheme for the consideration of his Excellency the Governor in Council, which I learned by Government Resolution, No. 319, dated 21st November, met with the full approval of Government. The accompanying Statement (Appendix I.) will prove how much an alternative line is required, even in the present efficient state of the land line between Kurrachee and Bombay. The Indian telegraph authorities objected that a cable would be an *opposition* line to the land line; but I respectfully submit that it would be no more an opposition line than the railroad to Poona is an "opposition" to the former carriage road. The railway over the Ghauts fails every year, and the old road is then found to be invaluable; in the same way the land line of the telegraph fails regularly every monsoon, and the cable would take all the traffic, and *vice versa*, when the cable fails. At present when the land lines fail all telegraph communication with India is cut off. The immense advantage of having an alternative line has been very decidedly proved this year between Kurrachee and Guadur. A very simple calculation would prove that the laying of the cable would be remunerative to Government, as shown in my letter above referred to.

12. As directed in the Government Resolution under report, I have the honour to forward an estimate of the material required for the extension of the aerial line from Guadur to Bunder Abbas, together with an estimate of the cost of constructing the line.

13. The country between Guadur and Bunder Abbas offers none of those physical obstacles which made the construction of a line from Kurrachee to Guadur almost an impossibility.

impossibility. Scarcity of water and of fodder for camels, paucity of inhabitants, and the usual difficulties of working with large bodies of men through an utterly desert country, are the only obstacles to be overcome; and I have not the slightest hesitation in promising that the entire double line shall be completed within six months of the material reaching Kurrachee, if I am provided with the means, and no political difficulties are thrown in my way. I venture to mention this, because when constructing the line through Beloochistan, from Kurrachee to Guadur, such serious difficulties were thrown in my way that the maintenance of a camp of 300 men, doing actually nothing for upwards of two months, was necessitated, owing to conflicting orders having been received desiring the abandonment of the enterprise. Unless I had received the active support of, and direct encouragement and material assistance from, the Honourable Mr. Mansfield (the Commissioner in Sind at the time), I believe the line would not have been completed to this day; for the natives would have taken advantage of our hesitation, and have destroyed the line, and very probably have also attacked and destroyed my camp.

14. I am well acquainted with the country and the people, and I do not anticipate the slightest hindrance to the work if the subsidising and political requirements are permitted to remain in abeyance until the line is finished. The people are only too glad to see money circulated amongst them, and they themselves protected while working for us, when they will assist us in every way; but where the boundaries of the possessions of each chief are so loosely defined, subsidising one man only excites envy and jealousy, and would most probably cause his neighbours to give us trouble until they also receive black mail.

15. I hope to be able to forward Lieutenant Stiffe's chart of the cable route from Jask to Aden in the course of a week. If the scheme meets with the approval of Government, the cable might be on the spot by October of next year, and the preliminary survey could be completed before next monsoon.

16. The land line stores can be landed on the coast all the year round, except between 15th June and 15th September; and if they all reach Kurrachee by 1st September next, the line can be completed to Bunder Abbas by 1st March 1869.

17. I have sent Colonel Goldsmid a copy of this letter.

AÉRIAL LINE OF TELEGRAPH.

Guadur to Bunder Abbas.

	<i>Lengths.</i>	<i>Miles by Line.</i>
Guadur to Charbar -	- - - - -	115
Charbar to Jask -	- - - - -	190
Jask to Bunder Abbas -	- - - - -	165
TOTAL - - -		470 miles.

	<i>Material required.</i>	<i>Miles.</i>
Wire (double) lines -	- - - - -	1,000
Hamilton's standards, with English wooden tops, at 20 standards per mile -	- - - - -	9,400
Insulators, intermediate -	- - - - -	23,000
Ditto - terminal -	- - - - -	3,000
Brackets, sufficient on hand.		

Estimate of Cost of Material delivered in Kurrachee.

	<i>Rs.</i>
Wire, 1,000 miles, No. 5, at 50 rupees - - -	50,000
Standards, complete, 10,000 - - - -	1,30,000
Insulators, intermediate, 23,000 - - - -	23,000
Ditto - terminal, 3,000 - - - -	4,500
Brackets, sufficient on hand.	—
Total Cost of Material - - - <i>Rs.</i>	2,07,500

	<i>Rs.</i>
Labour, stores, freight, camel, carriage, establishment, and commissariat, at 800 rupees per mile -	3,76,000
Total Cost of Construction - - - <i>Rs.</i>	3,76,000

<i>Buildings.</i>								<i>Rs.</i>
At Charbar	-	-	-	-	-	-	-	10,000
At Jask	-	-	-	-	-	-	-	20,000
At Bunder Abbas	-	-	-	-	-	-	-	10,000
Total Cost of Buildings - - <i>Rs.</i>								40,000
ABSTRACT.								
Material	-	-	-	-	-	-	-	2,07,500
Construction of line	-	-	-	-	-	-	-	3,76,000
Buildings	-	-	-	-	-	-	-	40,000
GRAND TOTAL - - <i>Rs.</i>								6,23,000

(signed) *H. I. Walton,*
Director, Mekran Coast and Submarine Telegraph.

APPENDIX I.

INDO-EUROPEAN TELEGRAPH DEPARTMENT.

STATEMENT showing the Longest, Shortest, and Mean Time occupied in the Transmission of Messages from Bombay, Calcutta, and Galle to Kurrachee, during the Month of August 1867.

(During Monsoon Weather.)

DATES.		Bombay to Kurrachee.			Calcutta to Kurrachee.			Galle to Kurrachee.		
		Longest Time.	Shortest Time.	Mean Time.	Longest Time.	Shortest Time.	Mean Time.	Longest Time.	Shortest Time.	Mean Time.
		H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
August	1st	5 37	0 43	3 43	30 43	26 55	28 19	38 55	19 28	29 5
"	2nd	3 11	0 15	1 10	35 48	22 17	30 2	54 16	42 29	49 27
"	3rd	4 24	0 54	2 10	51 59	10 18	35 34	17 51	13 30	15 41
"	4th	27 35	27 35	27 35	77 28	23 53	44 56	34 23	30 53	32 19
"	5th	4 13	3 9	3 18	47 29	42 33	44 55	-	none.	-
"	6th	3 58	1 12	3 27	69 19	20 29	46 53	21 54	21 46	21 50
"	7th	4 39	1 38	2 38	33 21	7 6	15 50	28 16	24 0	26 8
"	8th	6 17	1 42	2 57	35 26	6 8	16 22	21 53	20 5	20 32
"	9th	9 58	0 53	3 50	76 8	11 2	28 51	17 23	17 23	17 23
"	10th	17 7	2 37	10 4	31 11	23 11	26 2	23 43	7 56	15 26
"	11th	-	none	-	114 45	33 33	53 36	-	none.	-
"	12th	3 58	0 18	1 26	49 8	44 1	46 8	-	none.	-
"	13th	20 34	8 29	15 33	31 33	18 17	26 31	-	none.	-
"	14th	21 30	11 51	18 56	52 1	27 36	39 24	-	none.	-
"	15th	47 18	45 5	45 49	55 24	21 23	32 46	81 19	81 19	81 19
"	16th	22 31	21 35	22 25	45 29	24 55	32 5	109 7	99 53	104 33
"	17th	-	none	-	-	none	-	-	none.	-
"	18th	-	none	-	135 42	112 53	125 39	159 23	151 18	156 28
"	19th	159 38	53 5	78 58	111 36	65 40	79 37	163 20	57 23	106 21
"	20th	71 8	50 5	67 3	79 0	50 48	73 7	86 43	70 3	81 5
"	21st	56 11	46 53	52 40	88 53	10 19	37 12	92 10	76 53	88 36
"	22nd	63 58	48 49	54 19	28 26	21 19	26 22	75 53	67 46	71 43
"	23rd	45 14	26 43	39 13	25 15	23 28	24 41	31 27	31 27	31 27
"	24th	51 41	26 15	38 58	52 0	45 8	47 55	-	none.	-
"	25th	65 26	27 29	45 6	49 33	49 33	49 33	69 44	52 6	60 55
"	26th	42 31	3 23	33 13	42 39	37 50	40 15	46 14	46 14	46 14
"	27th	21 7	1 2	7 35	27 32	6 51	16 54	-	none.	-
"	28th	10 55	6 58	9 41	12 41	5 5	7 32	29 38	27 16	28 27
"	29th	22 6	5 18	11 51	25 24	10 42	18 46	33 4	23 54	30 43
"	30th	22 19	3 34	7 24	35 34	4 47	13 2	60 21	35 30	51 47
"	31st	4 44	3 54	4 22	9 56	4 47	7 28	77 6	31 38	50 28
Mean of whole Month }		-	Hours -	24 13	-	Hours -	37 26	-	Hours -	76 18

(signed) *B. C. Wates,*
Traffic Manager.

Kurrachee, 3 September 1867.

From Lieutenant-Colonel *L. Pelly*, Her Britannic Majesty's Political Resident, Persian Gulf, to *C. Conne*, Esq., Secretary to Government, Bombay, Political Department, No. 118, dated Muscat, the 17th September 1867.

I HAVE the honour to acknowledge the receipt of the Government Resolution in the Indo-European Telegraph Department, No. 192, dated 21st August 1867.

2. I am of opinion that the maintenance of a telegraphic line across the Wahhabee territory would be quite impracticable. In the first place, the Wahhabee Government would be extremely jealous of such undertaking. At an interview I had with the Wahhabee Ameer between two and three years ago, the conversation turned for a considerable time on the telegraph; and he then particularly excluded all idea of our having a telegraph on what he called his Arabian side of the Persian Gulf. He informed me that even he himself had found it impracticable to maintain telegraphic stations between himself and a former Pacha of Egypt, who was a great friend of the Ameer's. During that attempt he had inflicted the several punishments on the Bedwins for injury to the telegraph, but his punishments were without effect, and eventually the telegraph had to be abandoned.

3. To the westward the Wahhabee States do not touch the sea; and the regions on the west and south-western angle of the Wahhabee territories would probably be nearly as difficult to handle as the Wahhabee territory itself.

4. My respectful but decided counsel to Government would be absolutely to refrain from any attempt to station telegraph clerks or put up a telegraph line through Central Arabia.

5. Indeed, referring to our Asiatic land lines in general, I would submit that the more I learn of these regions the more strongly I am impressed that large political considerations point to a sea line from England to Alexandria, and from Suez to Bombay, provided such line be practicable, and even if such a sea line should have to be made in duplicate, in view to providing for interruption, still the cost of even this duplicate sea line might perhaps, on the long run, prove economical from a political point of view.

6. Useful as are the land lines traced from the Persian Gulf, Government doubtless bear in mind that these lines may fail us at the moment when they shall be most required in the military and political departments.

From *H. I. Walton*, Esq., Director, Mekran Coast and Submarine Telegraph, to the Secretary to the Government, Bombay, No. 847, dated Kurrachee, the 4th September 1867.

IN continuation of my letter, No. 839, dated yesterday, I have the honour to forward a plan prepared by Lieutenant Stiffe, showing the proposed route for the cable connecting Bombay and Aden.

2. A difference in the lengths of the several sections will be noticed between those stated in my letter and those referred to on the plan. This difference arises chiefly from my having calculated in statute miles, and Lieutenant Stiffe's calculations being in nautical miles.

3. Lieutenant Stiffe proposes to have a station at Makulla between Aden and Hallain, and I agree with him that it would be advisable to have an intermediate station there in a telegraphic point of view, and perhaps Government may deem it advantageous in a political point of view.

4. Lieutenant Stiffe's Report, with charts, in detail, will be forwarded by next steamer.

From the Director, Mekran Coast and Submarine Telegraph, to the Secretary to Government, Bombay, No. 896, dated Kurrachee, the 24th September 1867.

IN continuation of my letter No. 847, dated 4th instant, I have the honour to forward a letter from Lieutenant Stiffe, engineer, submarine cable, also a set of four charts filled in by that officer, and on which is indicated the proposed route for a submarine cable between Cape Jask and Aden.

Letter No. 94, dated 14 Feb. 1865, from Mr. Walton to the Secretary to Government; despatch No. 10, dated 9 March 1865, from the Governor in Council to the Secretary of State.

2. From the correspondence marginally noted it will be observed that Government requested that 160 miles of deep-sea cable and 10 miles of shore end should be sent from England, in order that the telegraph station at Mussandom might be removed to Angaum.

3. This cable, which is worth upwards of 50,000 £, was duly received in this country in July of last year; but as the sanction of Government to the removal of the station has been withheld, the cable is coiled down in tanks at Manora, where, notwithstanding that every precaution is taken for its preservation, it is undoubtedly deteriorating every day. A submarine cable should be submerged as soon as possible after it is manufactured, and I think that a serious risk is incurred in keeping this cable so long and to no purpose.

4. Under the above circumstances (should Government have arrived at no final decision regarding the occupation of Angaum), and keeping in view that Jask will be a station when the land line is extended from Guadur to Bunder Abbas, and that it is proposed to branch off the Arabian coast cable from there, I would respectfully beg to urge that the telegraph station should at once be removed from Mussandom to Jask, the cable being protected over the isthmus, as suggested in paragraph 5 of my letter to Colonel Goldsmid (No. 572, dated 29th June last), a copy of which was forwarded to Government with my letter No. 655, dated 19th July. Owing to the increased rate of sickness at Mussandom, and the destruction of all the outhouses and most of the dwelling-houses by fire, the advisability of removing the station has become even more apparent than before.

See para. 25 of my letter, No. 471, dated 4 June 1867.

5. Should this recommendation be adopted, I would not advise that any station be at present opened between Jask and Bushire. The cable sent out for the Angaum extension might in this case be used for some other purpose; at any rate, it would be better to make any use of it than to keep it sweltering in the tanks unused. If Government would wish Aden and Perim joined, I could arrange for this being done immediately and within a month of receiving instructions. Unfortunately, we have about 40 miles less cable than would be required to connect Jask and Muscat, and much less than is required for any other section of the proposed Arabian coast line, except the above.

6. Should Government approve of my suggestion to use part of the cable on hand in connecting Aden and Perim, I might be permitted to proceed to arrange for the establishment of a telegraph office at either end, and take with me a small party to work the cable, consisting of one superintendent and four clerks for the two stations; so that, on the arrival of the *Amberwitch* with the cable, everything would be ready for opening communication, and that vessel might be usefully employed on her return voyage in examining the Arabian coast between Aden and Muscat.

From Lieutenant *A. W. Stiffe*, late Indian Navy, Engineer, Submarine Telegraph, to *H. I. Walton*, Esq., Director, Mekran Coast and Submarine Telegraph, No. 168; dated Kurrachee, 4 September 1867.

1 Tracing of Arabian Sea.

3 Sheets, Coast of Arabia.

1 „ entrance, Persian Gulf.

I BEG to submit the following report, with plans as per margin, with reference to our conversation on the subject of telegraphic communication between the Red Sea and India, and after carefully considering the subject.

2. In the absence of any information whatever as to the depth of the Arabian sea and the nature of the bottom, I would not recommend a direct line either from Aden or *viâ* Sokotra or Kooria Moorla to Bombay.

3. I believe it is now generally allowed that no telegraph cable should be laid in very deep water, if it can be avoided by making a detour; the incurred risk while laying, as well as the difficulty and expense, if not impossibility of repair, are sufficient reasons against it. By deep water I mean depths exceeding, say, 500 fathoms.

4. From the soundings taken by the *Cyclops* at the head of the Arabian Sea, between Rasel Head and Kurrachee, where there were depths of 1,800 fathoms, I think there is reason to expect a depth exceeding that of the Atlantic in the direct route between India and the Red Sea.

5. The route I would recommend, shown in red lines on the accompanying tracing, is in moderate depths along the coast from Aden to Muscat, with a station of observations at the Kooria Moorla Islands, and, if practicable, also at Makulla. With a properly proportioned cable the whole line from Muscat to Aden (1,200 miles) could be worked through as one section, if it were found difficult to maintain the necessary signallers at Kooria Moorla.

6. From Muskat the line would join the present Indo-European line either at Mussandom or, if that place be abandoned, at Jask, or the point on the Mekran coast west of Guadur to which it shall be found practicable to extend the Mekran land line.

7. To complete the communication, it would be advisable to lay the cable between Kurrachee and Bombay, which has been proposed, and is desirable also on other grounds.

8. The

8. The comparative net lengths of the direct and proposed lines are as follows (*see also* general tracing):—

	Nautical.
Perim—Aden - - - -	110 miles (same in each case).
Aden—Bombay (direct) - -	1,640 miles (net).
Aden—Kooria Moorla (direct) -	705 nautical miles.
Kooria Moorla—Bombay - -	959

1,664 (net).

Proposed Route.

	Nautical Miles.
Aden—Makulla - - - -	282
Makulla—Hallain - - - -	468 (Kooria Moorla).
Hallain—Muscat - - - -	487
Muscat—Jask - - - -	165

Kurrachee—Bombay - - - - 1,402 (net).
520 if included.

1,922 (net).

Adding the section Aden, Perim would give a total length of 2,032 miles; and allowing $7\frac{1}{2}$ per cent. for slack, we have 2,185 knots as the gross length of cable required for the proposed work. Although the direct line is somewhat shorter when taking the Kurrachee—Bombay cable into account, yet as at least double the per-centage of slack would have to be allowed for in such deep water, the difference in the quantity of cable required to be made is thereby reduced within narrow limits.

9. The advantages of the proposed route, in addition to the facility of laying and repairing the cable, are, that it provides an alternative line between Kurrachee and Bombay, and also puts Muscat in connection with India. The shortness of the sections also admits, if necessary, of an increased speed in signalling.

10. I now beg to refer to the question of the necessary preliminary examination of the route. The south-east coast of Arabia has been well surveyed, and I have shown on the accompanying three large sheets the proposed line of the cable, also the breadth of the belt of the sea bottom between 20 and 100 fathoms, which would be the most convenient depth to lay a cable in. As will appear from an inspection of the charts, this belt is in parts very narrow and steep, and so close to the shore that its exact breadth should be further examined. The places marked (A.) on the charts appear to require special attention.

11. At the steeper portions of the bank additional deep-sea soundings should be taken to a depth of 500 fathoms, especially where the proposed cable line unavoidably passes outside the 100 fathoms contour. The landing places at the different stations also require examination, and careful observations should be made on the nature of the sea bottom along the whole line, also of the tides and currents.

12. Soundings also require to be taken between Jask and Muscat along the proposed line of the cable shown on the remaining large scale sheet. It is intended that the greatest depth on that line should not exceed 400, or at most 500 fathoms. It would, I consider, be preferable to make a longer circuit, and lengthen the section by 20 or 25 miles, than to exceed the latter depth.

13. In my No. 187, of 1867, I have already fully reported on the line between Kurrachee and Bombay.

14. There would be a great convenience in having the cable of the same pattern as the Persian Gulf cable, which would be well adapted for the proposed line, as the necessity of having two stocks of spare cable of different kinds for repairs would be obviated. Owing to the great depth of water near the shore, the length of shore end required for all the stations would not exceed 20 miles.

15. For the survey a vessel should be fitted out especially, with a steam winch and reel for deep-sea soundings; also the necessary lines and leads, which latter, if not available in Bombay, might be sent overland to Aden. The whole preliminary examination should not occupy more than three or four months.

16. Information as to the temperature of the sea at different depths should be obtained while sounding.

(No. 29.)

PLAN of the ARABIAN SEA, referred to in the foregoing, showing proposed Telegraphic Communication between the Red Sea and India.

THE thick red lines show proposed cable sections; the red figures the net lengths of the sections; the names of the proposed stations are underlined red.

The thin red lines show the direct lines, Aden to Kooria Moorla, Sokotra, and Bombay. The blue lines show the present Indo-European lines actually at work; and the broken blue line an extension of land line proposed in connection with existing lines.

The broken red line shows an alternative line from Maskat to Musendom instead Jashk, until Musendom station is moved to Jashk.

TABLE showing Comparative Lengths of Direct and Proposed Lines.

SECTION.	Now Proposed.	Direct <i>viâ</i> Kooria Moorla.	Direct.	REMARKS.
	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	
Perim—Aden - - - - -	110	110	110	
Aden—Makulla - - - - -	282	705		
Makulla—Hallani - - - - -	468			
Hallani—Maskat - - - - -	487			
Maskat—Jashk - - - - -	165			
Hallani—Bombay - - - - -	-	959		
Aden—Bombay - - - - -	-	-	1,640	
Total - - -	1,512	1,774	1,750	Net.
Karachi—Bombay (if required) - -	520	.		
Net - - -	2,032			
Add slack, $7\frac{1}{2}\%$ for shallow, and 15% } for deep water - - - - -	152	265	262	
Gross Lengths required - - -	2,184	2,039	2,012	

(signed) Arthur W. Stiffe, Lieut. I. N.,
Eng. Sub. Telegraph.

(No. 30.)

From the Foreign Secretary, India, to the Secretary to the Government, Indo-European Telegraph Department, Bombay.—No. 153; dated Fort William, the 13th December 1867.

I HAVE the honour to acknowledge the receipt of your letter, No. 241, dated 19th ultimo, replying to the letter from the Home Secretary, dated 22nd July, on the subject of the lines of telegraph alternative to the submarine line between Gwadar and Fao, and am directed, in reply, to make the following observations:—

2. As regards the project for a land line from Gwadar, it is stated by the Government of Bombay that a further report will be submitted on Colonel Goldsmid's arrival from England. His Excellency in Council desires me to suggest that Colonel Robinson, who will also shortly be at Bombay on his return from England, might be consulted with advantage.

3. The Governor General in Council observes that it is proposed to consider this question in connection with the transfer of the telegraph station from Mussendom to Angaum. On this subject I am desired to state that the recommendations of Mr. Walton in his letter, dated 24th September, urging the early transfer of the station from Mussendom to Jask, should have immediate attention.

4. His Excellency in Council is of opinion that the Aden line, *viâ* Jask, is plainly the proper one for the Red Sea communication, and the proposal to survey it after the removal from Mussendom is accordingly approved.

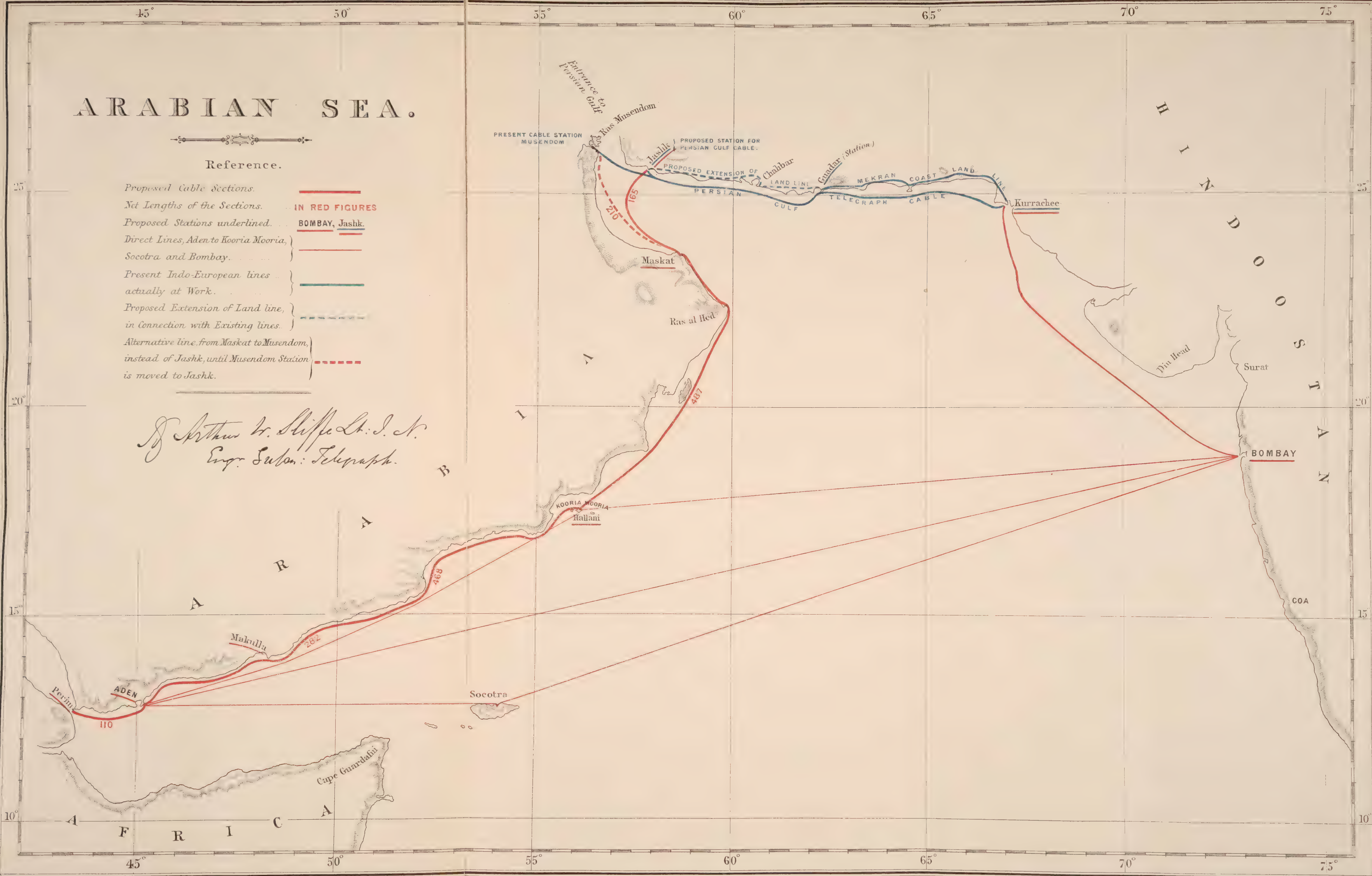
5. The project of carrying a line through the Wuhabee country is clearly impracticable.

ARABIAN SEA.

Reference.

- Proposed Cable Sections. —
- Net Lengths of the Sections. IN RED FIGURES
- Proposed Stations underlined. BOMBAY, Jashk.
- Direct Lines, Aden to Kooria Moorla, }
Socotra and Bombay. } —
- Present Indo-European lines }
actually at Work. } —
- Proposed Extension of Land line, }
in Connection with Existing lines. } - - -
- Alternative line, from Maskat to Musendom, }
instead of Jashk, until Musendom Station }
is moved to Jashk. } - - -

*J. Arthur W. Shippey Lt. J. N.
Eng. Subm. Telegraph.*



MEMORIAL, dated 4th January 1868, from Members of the Bengal Chamber of Commerce, Merchants and Bankers of Calcutta, and others, to His Excellency the Viceroy and Governor General of India in Council.

THAT your Memorialists are extensively engaged in the trade of the port of Calcutta and deeply interested in all matters affecting the commercial welfare of British India.

2 That, in order to promote the progress and prosperity of the commerce of British India, and encourage the extension and improvement of internal traffic, it is expedient that the enterprise and industry of your Memorialists should receive such assistance and support as your Excellency can give.

3. That, in view of the great and increasing commercial relations subsisting between India and Great Britain, it is of the highest importance to the interests of your Memorialists that speedy and regular telegraphic communication should be maintained between the two countries.

4. That your Memorialists have grave cause of complaint as to the manner in which the existing telegraphic service between the two countries is carried out.

1st. As to the length of time occupied in the transmission of messages, and the constant interruptions that occur on the lines.

2nd. As to the imperfect and occasionally unintelligible manner in which messages are transmitted ; and,

3rd. As to the irregular order in which messages are received in India, those of a later date being constantly delivered some days before others of an earlier date.

5. That these delays, errors, and irregularities are most detrimental to the interests of commerce, and comparatively neutralize the benefits which the country would otherwise derive.

6. That, in the belief of your Memorialists, these interruptions and confused transmissions are principally attributable to the fact that a considerable portion of the line passes through Turkey and Persia, and is altogether out of English jurisdiction, and that the wires are under charge of native clerks unacquainted with the English language, and, consequently unsuited for the duties with which they are entrusted.

7. That your Memorialists understand it has been proposed to establish a new direct line of effective telegraphic communication between London and India *via* Egypt and Aden by submarine cable to Bombay, and thence by land wires along the line of railway to Calcutta: but that, failing the support of Government in the shape of a guaranteed interest, the difficulties in raising the required amount of capital cannot be overcome.

8. That, on political grounds alone, the expediency of connecting England and India by such reliable, rapid, and controlled telegraphic communication is prominently marked by the annals of the past.

9. That your Memorialists learn through advices from England that the question of granting a guarantee of 5 per cent. on the required capital for promoting this project has been referred for settlement to the Government of India by the Home Government.

10. That your Memorialists, therefore, most respectfully but strongly urge your Excellency to support, in the manner indicated, such a scheme as will bring India into uninterrupted and more direct communication with England, such, for instance, as that detailed in the prospectus of the Anglo-Indian Telegraph Company, the advantages of which are,

1st. That the proposed line would be under one management and control.

2nd. That it would be worked exclusively by an English staff.

3rd. That the transmission of messages by the route indicated would occupy less time than at present.

4th. That the projected line would be far more freely availed of than that existing, and, in consequence, messages would be transmitted at cheaper rates.

11. The national as well as commercial importance of these advantages is such, your Memorialists respectfully submit, as to call for encouragement at your Excellency's hands, and in affording the pecuniary assistance required, the Government would, in the opinion of your Memorialists, be undertaking only a nominal risk.

12. Your Memorialists, therefore, venture respectfully to express their hopes that, having due regard to the magnitude of the interests, political, commercial, and social, involved in the connection between this country and England, your Excellency may see fit to grant the concession advocated.

And your Memorialists will ever pray.

(No. 134; dated 10th February 1868.)

From Foreign Secretary, India, to Members of the Chamber of Commerce, the Bankers and Merchants of Calcutta.

HAVING laid before the Viceroy your memorial of the 4th ultimo regarding the establishment of a second line of Electric Telegraph between England and India, *via* the Red Sea, I am instructed to inform you that this important subject has received, and still is receiving, the best attention of his Excellency in Council; and that a Despatch on the general bearing of the whole matter, together with a copy of your memorial under acknowledgment, has been transmitted to Her Majesty's Secretary of State for India.

(Telegraph, No. 20.)

To His Excellency The Right Honourable the Governor General of India
in Council.

Sir,

India Office, London, 30 April 1868.

Para. 1. I HAVE had under consideration in Council your Excellency's Despatch, No. 8, of 15th February last, and the memorial therewith transmitted, urging the concession of Government assistance to a project for a telegraphic line, *via* Egypt and Aden, to Bombay.

2. Without entering into any other considerations involved in this subject, it may be sufficient to point out that, if any further expense is to be incurred by the State, the amount ought to be divided between the Imperial and Indian exchequers, and that there is no present probability of pecuniary aid, in the shape either of a subvention or a guarantee, being given by the British Exchequer.

I have, &c.

(signed) *Stafford H. Northcote.*

(No. 11 of 1868.—Government of India.—Foreign Department.)

ELECTRIC TELEGRAPH.

To Her Majesty's Secretary of State for India.

Sir,

Fort William, 1 April 1868.

WITH reference to our Despatch, No. 8, dated 16th ultimo, regarding the establishment of a second line of Electric Telegraph between England and India, *via* the Red Sea, we have the honour to transmit copies of three further memorials which we have received from the mercantile community of Bombay, and the Chambers of Commerce at Kurrachee and Madras.

2. We also enclose a transcript of our reply to the Governments of Bombay and Madras, by whom the memorials were forwarded.

We have, &c.

(signed) *John Lawrence.*
G. N. Taylor.
W. N. Massey.
H. M. Durand.
H. S. Maine.
John Strachey.

(No. 27, dated 29th February 1868.)

From Secretary to Government, Bombay, Indo-European Telegraph Department, to
Secretary to Government of India, Foreign Department.

I AM directed to transmit the accompanying memorials to the address of the Right Honourable the Viceroy and Governor General of India, one by the principal merchants, bankers, and others in Bombay, and the other by the Kurrachee Chamber of Commerce, praying for a Government guarantee for any well-considered scheme for connecting India and England by direct submarine telegraphic communication *viâ* the Red Sea.

His Excellency in Council desires me to submit, at the same time, for the consideration of the Government of India, the accompanying papers, as per margin.

Remarks by Major Champain on the Bombay Memorial.

Letter from Major Champain, dated 18th December.

Letter from Colonel Goldsmid, dated 2nd October, with accompaniments.

Government Resolution, No. 27, dated 29th February 1868.

MEMORIAL, dated — November 1867, from Merchants, Bankers, and others in Bombay, to His Excellency the Viceroy and Governor General of India in Council.

THAT your Memorialists are informed that the question of establishing a direct line of telegraphic communication between Great Britain and India, by laying a submarine cable from Suez to Bombay in connection with other cables and telegraphic wires already existing between London and Suez *viâ* Malta, is at present engaging the attention of persons of influence and experience at home, who have memorialised Her Majesty's Secretary of State for India in Council to assist in carrying out the scheme by granting a Government guarantee of five per cent. on the required capital, on a plan similar to that enjoyed by the various Indian Railway Companies.

That your Memorialists are further informed the Secretary of State for India has expressed his intention to refer the question of guarantee to your Excellency in Council for consideration, and, in these circumstances, your Memorialists venture to hope a brief expression of their views on a subject of so much public importance may not be unacceptable to your Excellency.

That the existing line of telegraph between India and England *viâ* the Persian Gulf, Bagdad, Constantinople, and the Continent of Europe, is irregular and uncertain in its working, subject to constant delays, errors, and irregularities in the transmission of messages, while complete interruption of all communication whatever for more than a week at a time occasionally occurs.

That these frequent delays and uncertainties deter the public from using the line so freely as they otherwise would do, and the result is that the present Indo-European telegraph comes far short of fulfilling those conditions of accuracy, regularity, and speed necessary to render it the great benefit it ought to be to the commercial and public interests alike of England and India.

That the admitted defects and shortcomings of the present line are mainly due to the fact that it passes through large tracts of foreign territory, much of it wild and uncivilised, where European management cannot be brought to bear, and where ignorant and untrained native officials are alone obtainable.

That your Memorialists are respectfully of opinion, the only remedy for the evils complained of, in reference to the present line of telegraph, is to adopt a route which will have the incalculable advantage of connecting India and England by a complete line of telegraphic communication, free from the accidents and dangers of foreign interference, and with the entire management and direction placed in English hands.

That a scheme of the character here indicated would, in the opinion of your Memorialists, be best carried out under the auspices of a well-organised English Company; but your Excellency hardly requires to be informed that the recent extensive collapse of joint stock enterprise has rendered the formation of any new Company, however excellent its object, or however hopeful its prospects, a matter of the greatest difficulty; and there is reason to fear that a Company formed for the purpose of carrying out a project so desirable and so important on public grounds as that under consideration, would be unable to raise sufficient capital without the aid of a Government guarantee.

That the placing of India in direct and independent telegraphic communication with Great Britain by a route which would throughout be under English direction and control, is an undertaking of national importance, entitling it to rank among those other great public works which Her Majesty's Government has felt justified in aiding with the assistance of a Government guarantee.

That the liberal policy which has been adopted by the Government of India, in reference to the construction of Indian Railways, has been the means of conferring the most signal benefits on Her Majesty's Indian empire; and your Memorialists respectfully submit that a line of telegraph of the character already described, uniting India and England by almost instantaneous communication, in a manner more perfect and complete than can possibly be done by any existing means, is, alike on commercial and political grounds, scarcely second in importance to railways, and no less deserving of Government support.

That in thus venturing to lay their views before your Excellency, your Memorialists disclaim all wish or intention of supporting any particular company or scheme. Their

sole object is to express to your Excellency in Council their sense of the national importance of the question, and to state that, in their humble judgment, any well-considered scheme brought forward by men of character and experience that may be submitted for the consideration of your Excellency's Government, and which may on public grounds be otherwise approved of, should, in the interests of the public, be encouraged with the assistance of a Government guarantee.

That, in the event of a scheme of this nature meeting the approval and receiving the support of your Excellency, your Memorialists are respectfully of opinion that, in affording a guarantee of five per cent. on the requisite capital, the pecuniary risk undertaken by Government would in a very short time prove to be altogether nominal; while, on the other hand, the Government of India would be entitled to impose, and would no doubt be careful to dictate to the Company undertaking to carry out the scheme, such terms and conditions as would ensure the service being conducted in a manner that would be satisfactory to Government and conducive to the public interests.

Your Memorialists, therefore, beg respectfully to express their earnest hopes that any well-considered scheme of the character herein described that may be submitted through Her Majesty's Secretary of State for the consideration of the Government of India, may, in view of the magnitude of the material and moral interest that now unite India and England, receive your Excellency's approval and sanction.

And your Memorialists will ever pray.

MEMORIAL, dated 3rd February 1868, from Chamber of Commerce of Kurrachee, to His Excellency the Viceroy and Governor General of India in Council.

THAT your memorialists unite most cordially with the leading members of the mercantile community in Bombay and elsewhere in petitioning your Excellency in favour of the laying of a cable from Suez to Bombay, in connection with the telegraphic system existing between the former place and England, under a Government guarantee of five per cent., and to be under British control.

That they concur fully in the reasons adduced by the merchants, bankers, and others of Bombay and elsewhere, in support of the projected enterprise; and would point to no better proof of its urgency than the fact that the Indo-European telegraph line between this and Fâo, which is entirely under the administration of English officers, works most satisfactorily, whilst the numerous interruptions and irregularities complained of occur in foreign territories, even to a great extent beyond Constantinople. Your memorialists have peculiar facilities for judging of this, being residents at the terminal station of the Indo-European line, and being furnished with a daily report of latest dates received, and of when and where interruptions occur.

That the system of telegraphy with which the Indo-European service is connected is so subservient to the exigencies, commercial as well as political, of the many European countries which it traverses, that, were there no physical obstacles in the way, a suspension of business, as regards India, of a most disastrous character, is liable to take place at any moment, and to last for an indefinite period.

That this is made apparent by the fact that, when communication is broken on the Turkish line beyond Diarbekir, or between Constantinople and the West, telegrams have been despatched *via* Alexandria, although at nearly double the cost, and have reached their destination quicker even than if the other lines had been in good working order.

That whilst your memorialists believe that a Government guarantee would be essential to enable the projected Company to raise the capital required, they also are of opinion that the guarantee would be met by profits, and that Government would not be called upon to make good any deficiency.

Your memorialists therefore beg most respectfully that your Excellency will be pleased to accord to the scheme that support which its importance, from every point of view, appears to deserve.

And your Memorialists will ever pray.

(Dated 14th December 1867.)

REMARKS on the Memorial of certain Merchants and Others in Bombay, on the subject of the Red Sea Telegraph Scheme.

THE memorialists observe that "the only remedy for the evils complained of in reference to the present line of telegraph, is to adopt a route which will have the incalculable advantage of connecting India and England by a complete line of telegraphic communication free from the accidents and dangers of foreign interference, and with the entire management and direction placed in English hands.

They then proceed to urge that Her Majesty's Government should grant a guarantee of five per cent. on the requisite capital in the same liberal way which has been adopted in reference to the construction of Indian railways. At the same time, the memorialists disclaim

disclaim all wish or intention of supporting any particular company or scheme, so that I am not quite able to understand the grounds on which they come to the conclusion that in affording this guarantee "the pecuniary risk undertaken by Government would in a short time prove altogether nominal."

The Red Sea Company, in connection with the Telegraph Construction and Maintenance Company, not only asks for this guarantee of five per cent., but stipulates in addition that the present Persian Gulf cable should be made over to its care, undertaking in return to relieve the Government from its former unfortunate guarantee of the original Red Sea cable, which involves, I think, a yearly payment of 36,000 *l*.

The cost of the new cable from Suez to India is estimated at about 1,000,000 *l*. sterling.

The simple question of a fresh guarantee is one that I will leave for the present. As will be gathered from my remarks further on, I believe that by granting it Government will be heavy losers. But if they not only do so, but also hand over the Persian Gulf cable to the same company, I fear that the prospect of securing a good line between England and India will be completely destroyed.

The two routes, *viâ* the Red Sea and *viâ* the Persian Gulf, are, from end to end, entirely distinct from, and naturally opposed to, one another. If one succeeds, the other must more or less fail; and to place both in the hands of one company will, I cannot but think, be a very serious and almost irreparable mistake.

Let the Red Sea line work on its own merits against that *viâ* the Persian Gulf, and I believe the latter will prove the better in the long run.

The former, as now proposed, appears to me to possess scarcely one advantage over the existing line, while, on the other hand, it has many weak points from which the latter is exempt.

The new line is to pass through France, Italy, Sicily, the Malta-Alexandria cable, Egypt, and the Red Sea.

I doubt whether the French Government will devote special wires for this scheme; but at any rate I will assert, without fear of contradiction, that this portion of the line will *never* be "placed in English hands."

Italy, the entire length of which has to be traversed, is for many reasons, which will suggest themselves, not a very good country to which to trust in an undertaking of this nature.

Then comes the submarine line to Malta, and then the Malta-Alexandria cable. This cable is in a very precarious condition, is continually breaking down, and if the line is to be as good as our own, another cable, at a very great expense, must assuredly be laid.

The land telegraph across Egypt might easily be managed; but when projectors talk of a line being "under English direction and control," "reliable in time of war," &c. &c., it should not be forgotten that this "direction and control" will, as regards a great portion of the Red Sea route, be very limited, if more than nominal, and that in time of war, communication through Egypt could be prevented by any power that chose to bribe an Arab or Egyptian.

The Red Sea cable must cost 1,000,000 *l*. The first cable failed utterly, and though I take it for granted that English engineers would now succeed in laying one, yet I am sure that in such an intricate sea and on such a cruel bottom breaks would be constantly occurring, and repairs would be difficult and costly to effect.

In the Persian Gulf, where the bottom is, as a rule, excellent, accidents to the cable are nearly unknown; but outside, where the line rests on a rocky bed in shoal water, it has parted seven or eight times.

I regret that I cannot now refer to the prospectus drawn up by the Red Sea Company; but if I remember rightly, they promise themselves thrice the present traffic at 5 *l*. a message.

The Indian Government has already consented to reduce the tariff by the Persian Gulf cable, so as to alter the present charge of 5 *l*. to 3 *l*. 10 *s*.; and earnest representations have just been submitted by the French Administration, which, if complied with, will lower the entire charge to less than 3 *l*.

I believe that a costly submarine line like that contemplated by the Red Sea Company, to be started purely as a commercial speculation, could scarcely pay its expenses at 3 *l*. per message.

Briefly, I see no reason why it should work better than the Persian Gulf line, and I do see reasons why the breaks and interruptions should be more frequent.

I am not myself convinced that the management of a long line of telegraph passing through many countries must necessarily be perfect, simply because it lay in the hands of an English company. Our telegraphs at home are by no means free from mismanagement, and cannot in many respects compare with those of Prussia, France, and some other countries in Europe. The great system of European telegraphic communication is conducted in accordance with rules framed at International Congresses held once every three years, at which the representatives of various governments appear, but those of companies are not admitted as members; and no doubt this rule has been in some degree unfavourable to the development of telegraphic communication between England and the Continent.

I am clearly of opinion that it would be an immense advantage to obtain a line between India and England in the hands of one administration, or, failing that, in the hands of a few

few as possible. The present line *viâ* Turkey has not been successful, partly because it passes through so many different countries, and partly because of delays caused by "blocks," which can only be avoided by the setting apart of "through" wires for *Indian messages only*. Until quite recently we have not, perhaps, been sufficiently alive to this want, and naturally enough, foreign administrations have been loth to make exceptional arrangements for our traffic. During the past year we have obtained great concessions from the continental authorities, many of which, however, will not come into operation till the 1st January 1868; but I trust that when the special wires are set apart from end to end, as is promised by Convention, from the 1st proximo, the improvement in the working will be apparent.

I will venture to add a few lines on the subject of a proposed route, which will, I think, present advantages superior to the Red Sea line, and which entails no large expenditure, and requires no sort of pecuniary guarantee from the Government. I have already written very fully on this subject to the India Office, and possibly my letters may have been forwarded to the Government of Bombay.

The well-known English firm of Siemens and Halske have lately received extraordinary concessions from Prussia and Russia, and if Persia can be prevailed upon to grant them similar advantages between Julfa and Teheran, we shall very shortly have a *special double line* of the best description extending from London to Teheran, and absolutely under the control of an English company.

From Teheran to Kurrachee ought to be easily made trustworthy, and in fact at present, I think, there is not much to complain of as regards that link.

A great deal may be said in favour of a line of telegraph from London through Prussia, Russia, the Caucasus, and Persia to Bushire, a line which would, in truth, be in English hands from end to end, and which is now actually in existence, although in want of organization and sundry modifications.

Of course, in time of war between England and any powerful continental foe, this telegraph would fail, but so would fail with almost equal certainty a line through France, Italy, and Egypt. In fact, there are good grounds for believing that no submarine cable even would be safe were it really worth while to destroy it.

It is, perhaps, unnecessary to point out that the pecuniary risk of guaranteeing a cable far exceeds that which would be incurred in the case of a railway costing a like amount, unless the company would be content with a guarantee of profits so long only as the cable should be in a state of efficiency. I doubt whether they could raise the required capital on any such terms, and I repeat my conviction that the maintenance of the submarine line under consideration will be a very hazardous and costly experiment. Such an experiment might be made by a Government with the idea that no expense should be spared in securing a line which might in case of a sudden crisis prove invaluable, when the certain transmission of one message might be worth an empire's ransom; but I cannot think that this Red Sea scheme can pay as a *mercantile undertaking*; at any rate so long as the rival route remains in working order. If the projectors do not, to some extent, take this view of the case, why do they insist on taking over the Persian Gulf line?

In conclusion, I would beg to observe that although I have headed this letter "Remarks on the Memorial submitted by the Merchants of Bombay," I have done so solely because the memorial happened to be the paper forwarded to me for report.

My remarks, as will have been seen, apply almost entirely to the Red Sea cable scheme as explained to me in London by the promoters. I cannot but share the dissatisfaction with the existing state of things, as expressed by the memorialists, but at the same time I feel bound to point out the objections to what I firmly believe to be a fallacious project of reform.

(signed) J. U. Champain,
Assistant Director-in Chief, Indo-European Telegraph.

(No. 236, dated 18th December 1867.)

From Assistant Director-in-Chief, Indo-European Telegraph, to Secretary of Government of Bombay.

I HAVE the honour to acknowledge the receipt of correspondence regarding the proposal to connect Bombay with Aden by submarine telegraph, accompanied by your memorandum No. 248, calling for my observations on the subject.

I have no doubt that Colonel Goldsmid's Report on this proposal will reach you very shortly. His acquaintance with the geographical and political state of the coast of Mekran, and of the south-eastern frontiers of Persia and her dependencies, will enable him to form an accurate judgment on some points about which I know little; but I venture to submit at your request, a few remarks on Mr. Walton's two projects, viz., the extension of the land lines from Gwadur to Bunder Abbas; and, 2nd, the establishment of a telegraph between Bombay and Aden.

The construction of the aerial line between Ispahan and Bunder Abbas, as planned by Colonel Goldsmid, has been for the present at least postponed; and I cannot believe that the trade of Bunder Abbas itself is sufficient to call for the continuation of the Mekran land

land lines beyond Cape Jashk. I do not even recognise the necessity for extending them further than Gwador, unless the cable be laid as proposed *viâ* Muscat to Aden, in which case our single Persian Gulf conductor might possibly prove unequal to the call made on it by the combined traffic from Europe and from the Red Sea.

Supposing that the proposed Aden submarine line be laid, it seems to me that the Persian Gulf cable should be brought to land at Jashk, avoiding Mussendom and Angaum altogether, and thus concentrating three officers at one spot; that for the Persian Gulf cable (now at Mussendom); that for the Muscat-Aden cable; and that for the land line to Gwador and Kurrachee.

Mr. Walton's estimate of 6,23,000 rupees for extension of the Mekran land lines would thus be reduced to about 4,00,000.

If, on the other hand, this Aden submarine line is not to be laid, the maintenance of a station near the mouth of the Persian Gulf might be found unnecessary, and a considerable saving effected in the present working charges of the Indo-European cable. But I would on no account suffer the cable to be laid underground across the Mussendom Isthmus, and left to the mercy of the Arabs of those parts.

Referring, secondly, to the proposals for laying a submarine line between Bombay and Aden, I am decidedly of opinion that it would be better in every way to adopt the route recommended by Mr. Walton and Lieutenant Stiffe, *viâ* Jashk, Muscat, and the Arabian coast. The arguments against a direct deep sea line are insurmountable; but I should be inclined to have as few stations as possible between Muscat and Aden, and would rather work through a long length of cable with non-recording instruments than attempt to establish and maintain stations for European signallers on such a miserable coast.

I confess that I know little about it, but we are giving up Mussendom as uninhabitable. I can certainly say that Muscat is almost intolerable, and I believe that it would be excessively difficult to find places along the southern shores of Arabia which we should not soon wish to abandon just as we are abandoning Mussendom.

I have, in my memorandum of the 14th instant, to your address, stated, and given reasons for my impression, that the Red Sea Cable Company's scheme could not prove remunerative; and the receipts of a cable from Jashk terminating at Aden or Perim would hardly cover its monthly working expenses. To submerge a length of 2,690* miles in these seas would cost from 600,000 £. to 700,000 £. Joined *
with Suez by land lines, such a cable might keep open the communication between India and Europe when the Persian Gulf route is out of order; and viewed as an imperial undertaking, the capital to be sunk might not be considered out of proportion to the advantages to be anticipated.

Aden to Jashk	-	-	-	1,402
Kurrachee, Bombay, if included	-	-	-	520
Without slack.				1,922

(No. 132, dated 2nd October 1867.)

From Director-in-Chief, Indo-European Telegraph, to Secretary to Government,
Bombay.

WITH reference to the Government Resolution† accompanying copy of letter of the Government of India, No. 2614, dated 22nd July last, I have the honour to state that the probable cost of the land line of telegraph from Gwador to Bunder Abbass, and again from Bunder Abbass to Ispahan, was estimated in my letter No. 144, of 29th August 1866, to the Under Secretary of State, of which a copy was transmitted to the Government of Bombay with my No. 166, of 19th September 1866. Estimating alone the section now under consideration, or from Gwador to a point Midway between Jashk and Bunder Abbass, say 500 miles, the proportion would be about 4,00,000 rupees.

† No. 192, dated
21 August 1867.

Or 40,000 £.

The probable cost of maintenance yearly may be gathered from my letter No. 111, of 19th August 1867, to the Under Secretary of State, of which a copy is enclosed.

With regard to the suggestion that "a line by the Red Sea might be connected with the head of the Persian Gulf running through a portion" of Arabia, I would remark that, if the question be one of connecting Suez and Busrah, that is, the telegraph station at the head of the Red Sea, and any prolongation of that telegraph, with the "head of the Persian Gulf," that end is already achieved. Messages are now sent from Suez to Alexandria, Alexandria to Diarbekir, and Diarbekir to Baghdad, Busrah, and Fao, without break or interruption; and a special treaty with the Ottoman Government might readily ensure the utilisation of that line for occasions and emergencies, if not for ordinary telegraphic communication.

If my own opinion were asked on the best means of connecting Aden with Kurrachee by reverting to the old submarine line of telegraph along the coast of Arabia, I should suggest that, if the line were restored from Aden to the Kooria Moorla islands, there would be no necessity of crossing the large tract of ocean to Kurrachee. A prolongation to Muscat and Gwador (or Choubar), or Ras-el-Had and Gwador, would complete the link equally well. Aden would in such case be in telegraphic communication with England as well as Bombay, and with Suez also if necessary, *viâ* Baghdad, Diarbekir, and the Syrian Coast.

(No. 111, dated 19th August 1867.)

From Director-in-Chief, Indo-European Telegraph, to Under Secretary of State
for India.

WITH reference to the instructions under which I left England on the 18th October last year, and the Bombay Government Resolution, No. 112, of the 17th May last, I have the honour to submit, for the consideration of the Right Honourable the Secretary of State, the accompanying memorandum.

Should the views now set forth be approved, I would respectfully suggest that Her Majesty's Foreign Office be moved to instruct Mr. Alison to renew the negotiations for the land line of telegraph on the Shah's return from Meshed, with authority to offer the money grant as proposed up to 3,000 tomans per annum.

Her Majesty's Minister at Teheran, as also the Secretary of Legation, Mr. Thomson, are now well aware of the objects and details of the intended convention. These have, moreover, been fully stated by myself to the Persian Minister for Foreign Affairs. My presence at Teheran could not, that I am aware, be necessary to complete the diplomatic discussion in Persia. But I hold myself in readiness to proceed immediately to Bombay and the coast of Mekran, to arrange matters with the Beluch Chiefs in case Mr. Alison notify a favourable reply to the renewal of negotiations.

(No. 110, dated 19th August 1867.)

MEMORANDUM.

ON the 15th March last I reported to the Under Secretary of State the result of negotiations which I had been instructed to open with the Persian Government for the land extension of the telgraph. This Report has, I find, been submitted to the Right Honourable the Secretary of State by the Government of Bombay with further details, and an expression of opinion as to further proceedings by his Excellency the Governor and one of the Members of Council.

The last resolution of the Government of Bombay refers the question of the political department for consideration "as to how far, in respect of political relations, it is practicable to carry the land line westward along the coast from Gwador without consulting the Persian Government."

This consideration is a very important one, and will no doubt soon meet with attention. In the meanwhile, it will, perhaps, not be thought unadvisable to put in Mr. Alison's hands a proposition which, if acceptable to Persia, may obviate the necessity of adopting any course affecting, or supposed to affect, her interests without her consent and participation. The proposition is as follows:—

We pay, now, according to official statement for the year 1866, of the sum 42,371 rupees per annum for maintenance of our land line of telegraph from Kurrachee to Gwador. Of this, 21,000 is subsidy to chiefs.

It might be reckoned that at least a similar sum would be required were we to construct a land line, as proposed, from Gwador westward, to a point between Jashk and Bunder Abbass.

At the present exchange 10,000 tomans is the equivalent of 40,000 rupees. Half of this might, I think, be set aside for Persian territory, and half for territory in which Persia has no acknowledged jurisdiction.

A sum of 3,000 tomans (12,000 rupees) yearly to Persia to allow us to treat with the Sheikh of Bunder Abbass and any other chiefs on the coast of Beluchistan over whom she may assert control would, it is believed, be acceptable; and while we, on our part, give a guarantee of non-interference with political pretensions, we might reasonably expect a similar guarantee in return of non-interference in telegraph arrangements, so far as the whole coast line is concerned.

Roughly, the whole 40,000 rupees would be thus divided:—

Vide Despatch,
No. 17, of 11 March
1867, to Government
of Bombay.

2,500	Subsidy to Kelat.
2,500	Subsidy to the chiefs of Bahn.
5,000	Subsidy to Mir Abdullah.
10,000	for actual maintenance and repairs.
20,000	
12,000	Subsidy to Persia for Bunder Abbass, &c.
8,000	for actual maintenance and repairs.

Total - - - Rs. 40,000

It would, perhaps, be advisable to limit the whole grant to 50,000 rupees, thus allowing a margin for Muscat with reference to Choubar and contingencies.

(signed) *F. J. Goldsmid*, Lieutenant Colonel,
Director-in Chief, Indo-European Telegraph.

(No. 27, dated 29th February 1868.)

EXTRACT from the Proceedings of the Government of Bombay, in the Telegraph Department.

Resolution—Lieutenant Colonel Goldsmid having failed in negotiations for a land line (alternative of the Persian Gulf cable) from Guadur to join the main Persian lines by Ispahan, suggested in his letter, No. 17, of 11th March 1867, the continuation of the coast line from Guadur so far as practicable, in order at least to reduce the length of submarine cable on which the maintenance of telegraphic communication with Europe wholly depends.

2. In communicating this to the Government of India, his Excellency the Governor proposed an alternative submarine line *viâ* Aden to join the Egyptian Red Sea Coast line at some port in the Red Sea.

3. The Government of India, in reply, inquired the cost of the coast line extension from Guadur; and, agreeing with this Government in thinking it extremely desirable to take early steps for acquiring the necessary information preparatory to laying a line either from Bombay or Kurrachee to Aden, requested this Government to submit, at an early date, its views as to the best means of acquiring the information and an estimate of the probable cost of the line.

4. In rejoinder, the letter from this Government, No. 241, of 19th November, submitted Reports by Mr. Walton, the director of the Submarine and Mekran Coast Lines, and by Lieutenant Stiffe, the engineer of the Submarine cable, showing the estimated cost of the coast line extension to Bunder Abbas to be 6,23,000 rupees (which would be reduced to about four lakhs if the extension end at Jask as now seems probable), and also showing reasons for preferring a line from Aden by the Arabian Coast to Jask, to one direct to Kurrachee or to Bombay. The Government of India was at the same time informed that the survey of the proposed line and the preparation of the estimates would be undertaken so soon as the completion of the transfer of the Mussendom station to Henjam and other necessary facilities will permit.

5. The Government has now for consideration five other papers on the subject:—

1st. A memorial by certain merchants, bankers, and others in Bombay, representing the need for “connecting India and England by a complete line of telegraphic communication free from the accidents and dangers of foreign interference, and with the entire management and direction placed in English hands,” and further representing that such a scheme “would be best carried out under the auspices of a well-organised English company,” and recommending that a Government guarantee be given to enable such a company to obtain the needful capital.

2nd. Remarks by Major Champain on the memorial.

3rd. Remarks by Major Champain on the correspondence with Mr. Walton on the subjects under notice.

4th. Remarks by Lieutenant Colonel Goldsmid on the same subjects.

5th. A memorial by the Kurrachee Chamber of Commerce on the same subject.

6. As respects the first two papers, Major Champain's arguments appear conclusive against a Government guarantee to a private company for a Red Sea line. He suggests that, even in the Government point of view, a line through Prussia, Russia, the Caucasus, and Persia to Bushire, would offer equal advantages as an alternative resource. But this it clearly would not do in relation both to the sole dependance on the Persian Gulf cable and to political considerations in case of European war; and apparently the conclusion of his later letter on the same subject (the third paper noted above) is his more deliberate opinion, viz., that a cable from Jask to Aden or Perim “joined with Suez by land lines might keep open the communication between India and Europe when the Persian Gulf route is out of order; and viewed as an imperial undertaking, the capital to be sunk might not be considered out of proportion to the advantages to be anticipated.”

7. Colonel Goldsmid's letter may be regarded as concurrent respecting the line which communication with Aden should take, although he speaks of carrying the cable from the Arabian coast to Guadur.

8. The consideration of these papers confirms the previous conclusion to make the survey of the proposed line and the estimates of cost, so soon as the “Amberwitch” shall be free for the work.

9. The memorial will now be forwarded to the Government of India, with copies of the several Reports and of this Resolution.

10. Copies of the Reports and of this Resolution to be sent to the Bombay and Kurrachee Chambers of Commerce.

(No. 156, dated 10th February 1868.)

From Chief Secretary to Government of Fort St. George to Secretary to Government of India, Home Department.

Dated 24 January
1868.

I AM directed to transmit, for the consideration of the Governor General in Council, the annexed copy of a letter from the chairman of the Chamber of Commerce, relative to the proposals made by the Anglo-Indian Telegraph Company to establish an independent line of telegraph with India *via* Egypt.

(No. 155, dated 10th February 1868.)

EXTRACT from the proceedings of the Government of Madras, in the Public Department.

READ the following letter:—

(Dated 24th January 1868.)

From Chairman of the Chamber of Commerce, Madras, to Chief Secretary to Government, Fort St. George.

THE Madras Chamber of Commerce have had before them an application, dated 7th November last, made to the Secretary of State for India by the leading merchants and bankers in London, regarding the proposals made by the Anglo-Indian Telegraph Company to establish an independent line of telegraph with India by way of Egypt.

2. As the Madras Government are doubtless aware, this Company has undertaken to lay a submarine cable between Suez and Bombay, in connection with other cables and telegraphic wires already existing between London and Suez *via* Malta, on Her Majesty's Government deciding to guarantee an interest of five per cent. per annum on a capital of 1,000,000 sterling.

3. Referring to the urgent necessity of better telegraphic communication between England and India, the application of the London merchants states—

“The existing methods of carrying on those communications were described by the Committee of the House of Commons as imperfect in their organisation, inefficient in their working, and liable at any time to interruption from political and other causes entirely beyond the control of the British Government; and at the same time the advantages of telegraphic intercourse with India in relation to its trade with this country were fully set forth upon the evidence of the very competent witnesses who appeared before the Committee.”

And again—

“Considering the magnitude of the political, social, and other interests than those of commerce which are bound up in the maintenance of the existing relations between this country and India, we humbly submit that the policy of the establishment of a complete and effective system of telegraphic communication, such as that suggested, may be advocated upon grave and important grounds of an Imperial character; and we pray, therefore, that the proposal may receive the earnest and favourable consideration of Her Majesty's Government, with a view to its being carried into effect in the manner pointed out, or by such other means as the Government may deem most advisable.”

4. I would also beg to invite your attention to the accompanying memorials from merchants, bankers, and others in Bombay and Calcutta to the respective local Governments. The advantages, political and commercial, of the proposed new line are so fully explained in the accompanying papers, that the chamber have only to express a hope that the application of the memorialists may receive the support of the Madras Government.

From Members of the Bengal Chamber of Commerce, Merchants and Bankers of Calcutta, and others, to his Excellency the Viceroy and Governor General of India in Council.

THAT your memorialists are extensively engaged in the trade of the port of Calcutta, and deeply interested in all matters affecting the commercial welfare of British India.

2. That in order to promote the progress and prosperity of the commerce of British India, and encourage the extension and improvement of internal traffic, it is expedient that the enterprise and industry of your memorialists should receive such assistance and support as your Excellency can give.

3. That, in view of the great and increasing commercial relations subsisting between
India

India and Great Britain, it is of the highest importance to the interests of your memorialists that speedy and regular telegraphic communication should be maintained between the two countries.

4. That your memorialists have grave cause of complaint as to the manner in which the existing telegraphic service between the two countries is carried out—

1st.—As to the length of time occupied in the transmission of messages, and the constant interruptions that occur on the lines.

2nd.—As to the imperfect and occasionally unintelligible manner in which messages are transmitted; and,

3rd.—As to the irregular order in which messages are received in India, those of a later date being constantly delivered some days before others of an earlier date.

5. That these delays, errors, and irregularities are most detrimental to the interests of commerce, and comparatively neutralise the benefits which the country would otherwise derive.

6. That, in the belief of your memorialists, these interruptions and confused transmissions are principally attributable to the fact that a considerable portion of the line passes through Turkey and Persia, and is altogether out of English jurisdiction, and that the wires are under charge of native clerks, unacquainted with the English language, and consequently, unsuited for the duties with which they are entrusted.

7. That your memorialists understand it has been proposed to establish a new direct line of effective telegraphic communication between London and India *via* Egypt and Aden, by submarine cable, to Bombay, and thence by land-wires along the line of railway to Calcutta; but that, failing the support of Government in the shape of a guaranteed interest, the difficulties in raising the required amount of capital cannot be overcome.

8. That, on political grounds alone, the expediency of connecting England and India by such reliable, rapid, and controlled telegraphic communication is prominently marked by the annals of the past.

9. That your memorialists learn, through advices from England, that the question of granting a guarantee of five per cent. on the required capital for promoting this project, has been referred for settlement to the Government of India by the Home Government.

10. That your memorialists, therefore, most respectfully, but strongly, urge your Excellency to support, in the manner indicated, such a scheme as will bring India into uninterrupted and more direct communication with England, such, for instance, as that detailed in the prospectus of the Anglo-Indian Telegraph Company, the advantages of which are—

1st.—That the proposed line would be under one management and control.

2nd.—That it would be worked exclusively by an English staff.

3rd.—That the transmission of messages by the route indicated would occupy less time than at present.

4th.—That the projected line would be far more freely availed of than that existing, and, in consequence, messages would be transmitted at cheaper rates.

11. The national as well as commercial importance of these advantages is such, your memorialists respectfully submit, as to call for encouragement at your Excellency's hands; and in affording the pecuniary assistance required, the Government would, in the opinion of your memorialists, be undertaking only a nominal risk.

12. Your memorialists, therefore, venture respectfully to express their hopes that, having due regard to the magnitude of the interests, political, commercial, and social, involved in the connection between this country and England, your Excellency may see fit to grant the concession advocated.

And your memorialists will ever pray.

MEMORIAL, dated — November 1867, from Merchants, Bankers, and others in Bombay, to His Excellency the Viceroy and Governor General of India in Council.

THAT your memorialists are informed that the question of establishing a direct line of telegraphic communication between Great Britain and India, by laying a submarine cable from Suez to Bombay, in connection with other cables and telegraphic wires already existing between London and Suez, *via* Malta, is at present engaging the attention of persons of influence and experience at home, who have memorialised Her Majesty's Secretary of State for India in Council to assist in carrying out the scheme, by granting a Government guarantee of 5 per cent. on the required capital, on a plan similar to that enjoyed by the various Indian Railway Companies.

2. That your memorialists are further informed the Secretary of State for India has expressed his intention to refer the question of guarantee to your Excellency in Council

for consideration, and, in these circumstances, your memorialists venture to hope a brief expression of their views on a subject of so much public importance may not be unacceptable to your Excellency.

3. That the existing line of telegraph between India and England, *viâ* the Persian Gulf, Bagdad, Constantinople, and the Continent of Europe, is irregular and uncertain in its working, subject to constant delays, errors, and irregularities in the transmission of messages, while complete interruption of all communication whatever for more than a week at a time occasionally occurs.

4. That these frequent delays and uncertainties deter the public from using the line so freely as they otherwise would do, and the result is, that the present Indo-European telegraph comes far short of fulfilling those conditions of accuracy, regularity, and speed, necessary to render it the great benefit it ought to be to the commercial and public interests alike of England and India.

5. That the admitted defects and shortcomings of the present line are mainly due to the fact that it passes through large tracts of foreign territory, much of it wild and uncivilised, where European management cannot be brought to bear, and where ignorant and untrained native officials are alone obtainable.

6. That your memorialists are respectfully of opinion that the only remedy for the evils complained of in reference to the present line of telegraph is to adopt a route which will have the incalculable advantage of connecting India and England by a complete line of telegraphic communication free from the accidents and dangers of foreign interference, and with the entire management and direction placed in English hands.

7. That a scheme of the character here indicated would, in the opinion of your Memorialists, be best carried out under the auspices of a well-organised English company; but your Excellency hardly requires to be informed that the recent extensive collapse of joint stock enterprise has rendered the formation of any new company, however excellent its object, or however hopeful its prospects, a matter of the greatest difficulty; and there is reason to fear that a company formed for the purpose of carrying out a project so desirable and so important on public grounds as that under consideration, would be unable to raise sufficient capital without the aid of a Government guarantee.

8. That the placing of India in direct and independent telegraphic communication with Great Britain by a route which would throughout be under English direction and control is an undertaking of national importance, entitling it to rank among those other great public works which Her Majesty's Government has felt justified in aiding with the assistance of a Government guarantee.

9. That the liberal policy which has been adopted by the Government of India in reference to the construction of Indian railways has been the means of conferring the most signal benefits on Her Majesty's Indian Empire; and your Memorialists respectfully submit that a line of telegraph of the character already described, uniting India and England by almost instantaneous communication in a manner more perfect and complete than can possibly be done by any existing means, is, alike on commercial and political grounds, scarcely second in importance to railways and no less deserving of Government support.

10. That in thus venturing to lay their views before your Excellency, your memorialists disclaim all wish or intention of supporting any particular company or scheme. Their sole object is to express to your Excellency in Council their sense of the national importance of the question, and to state that, in their humble judgment, any well-considered scheme brought forward by men of character and experience that may be submitted for the consideration of your Excellency's Government, and which may on public grounds be otherwise approved of, should, in the interests of the public, be encouraged with the assistance of a Government guarantee.

11. That, in event of a scheme of this nature meeting the approval and receiving the support of your Excellency, your Memorialists are respectfully of opinion that, in affording a guarantee of 5 per cent. on the requisite capital, the pecuniary risk undertaken by Government would, in a very short time, prove to be altogether nominal; while, on the other hand, the Government of India would be entitled to impose, and would no doubt be careful to dictate to the company undertaking to carry out the scheme, such terms and conditions as would ensure the service being conducted in a manner that would be satisfactory to Government and conducive to the public interests.

12. Your Memorialists therefore beg respectfully to express their earnest hopes that any well considered scheme of the character herein described that may be submitted through Her Majesty's Secretary of State for the consideration of the Government of India, may, in view of the magnitude of the material and moral interests that now unite India and England, receive your Excellency's approval and sanction.

And your Memorialists will ever pray.

ORDERED, that the Chairman of the Chamber of Commerce, Madras, be informed that a copy of his letter above recorded will be submitted to the Government of India.

(No. 1241, dated 10th March 1868.)

Endorsed by Home Department.

Transferred to the Foreign Department for disposal.

(No. 268, dated 17th March 1868.)

From Secretary to Government of India, Foreign Department, to Secretary to Government, Bombay, Indo-European Telegraph Department.

(No. 269.)

The same to the Chief Secretary, Fort St. George.

HAVING laid before the Governor General in Council your letter No. 156, dated 10th ultimo, together, with its enclosure from the Madras Chamber of Commerce regarding, &c.

Madras

Chamber of Commerce.

Memorial.

HAVING laid before the Governor General in Council your letter No. 27, dated 29th ultimo, together with two Memorials therewith forwarded, regarding the establishment of a second line of Electric Telegraph between England and India *viâ* the Red Sea, I am directed to state, for the information of the *Bombay* Government, and for communication to the *Memorialists*, that this important subject has received, and is still receiving, the best attention of His Excellency in Council, and that a despatch on the general bearing of the whole matter has been addressed to Her Majesty's Secretary of State for India.

2. I am, however, to add that the *Memorials* in question will be transmitted to the Secretary of State.

(Telegraph No. 25.)

His Excellency the Right Honourable the Governor General of India in Council.

Sir,

India Office, London, 21 May 1868.

I HAVE received your Excellency's Despatch of the 1st April last, No. 11, forwarding Memorials from the Mercantile Communities of Bombay, Madras, and Kurrachee, praying that the support of the Indian Government may be afforded to promoters of a line of Telegraph to India *viâ* the Red Sea. On this subject it is only necessary to refer you to my Despatch of 30th April last, No. 20.

I have, &c.

(signed) *Stafford H. Northcote.*

Chamber of Commerce and Manufactures,

Sir,

Glasgow, 15 November 1867.

I AM instructed by the Directors of this Chamber to transmit to you the enclosed Memorial in regard to the existing system of Telegraphic communication with India, and

I have, &c.

(signed) *J. S. Fleming, Secretary.*

To the Right Honourable
Sir Stafford Northcote, Bart., M.P.,
Secretary of State for India.

To the Right Honourable Sir *Stafford Henry Northcote* Bart., M. P., &c. &c. Her Majesty's Secretary of State for India, and President of the Council for India.

The Memorial of the Directors of the Chamber of Commerce and Manufactures in the City of Glasgow, Incorporated by Royal Charter,

Respectfully sheweth,

THAT from the extensive commercial intercourse now existing between Glasgow and India, this Chamber are deeply interested in the system of Telegraphic communication between Great Britain and India.

That your Memorialists are constrained to characterise the system which has existed for some time as most unsatisfactory. The expense of transmitting messages is great, but of this your Memorialists would not complain if they could be assured that messages would reach their destination within a reasonable and definite period, and would be reasonably accurate when delivered. The just expectations of the public are in these respects almost invariably disappointed.

Your Memorialists have obtained from one firm in Glasgow, having a house of business established at Calcutta, a statement containing their experience with regard to messages transmitted by them from Glasgow to Calcutta, and transmitted to them by their Calcutta house during the last six months, commencing in April 1867.

It appears from that statement that during the six months there were sent from Glasgow to Calcutta in all 21 messages, at a total cost of 124*l.* 19*s.*, or on the average, 5*l.* 19*s.* each; that one message was delivered on the 26th day after its dispatch, that another dispatched from Glasgow on 24th August, has never been acknowledged by the Calcutta house; that, excepting these two messages, the remaining 19 required on the average upwards of six days for transmission, the longest period occupied being 15 days, and the shortest period (but that only in one apparently exceptional case) being two days. Only two of the messages were accurately transmitted, there being in the remaining 19 messages actually delivered no less than 46 errors

During the same period the messages received by him in Glasgow from Calcutta, were 26 in number, costing 209*l.* 2*s.*, or fully 8*l.* each, requiring for transmission on the average very nearly five days (the longest period being 13 days and the shortest two days. Only two of the messages were accurately rendered, there being on the average about five errors in each, the errors in one of the messages amounting to 15 in number, and in another to 10.

It is needless for the Memorialists to point out that a system of Telegraphic communication conducted with such results, must be attended with the greatest possible inconvenience, and may produce great loss, and practically is altogether unreliable.

Without going into great detail on this point it is scarcely necessary to point out that, for the purposes of those having connections in remote countries, as for example, Australia, it is impossible to rely with confidence that a telegram dispatched apparently in time to catch a particular steamer at some point in the telegraph route, would reach that place in time for transmission by the steamer.

Your Memorialists would suggest the formation of a new line of communication, to be worked exclusively by British subjects, and under British rule as far as practicable. It seems to your Memorialists that the route which has been pointed out, *via* Falmouth, to Gibraltar, Malta, Alexandria, and Suez, and thence to Aden, would secure the desired object.

Your Memorialists would call the attention of Her Majesty's Government to this matter, in the hope that they will give the subject their early and special consideration, and will adopt such measures as to them will seem suitable to remedy the defects complained of.

And your Memorialists will ever pray.

Signed in the name and by appointment
of the Directors of the Chamber of
Commerce and Manufactures of the
City of Glasgow at Glasgow the 12th
day of November 1867.

(signed) *Alex. Ronaldson*,
President.
J. S. Fleming,
Secretary.

The Under Secretary of State for India to *J. S. Fleming*, Esq.

Sir,

India Office 5 December, 1867.

I AM directed by Sir Stafford Northcote to acknowledge the receipt of your letter of the 15th ultimo, with Memorial enclosed from the Chamber of Commerce and Manufactures in the City of Glasgow calling attention to the present state of Telegraphic communication between this country and India, and suggesting the formation of a new line, *via* Falmouth, Gibraltar, Malta, Alexandria, and Suez.

In reply, I am to state that arrangements for improving to the utmost the existing lines of Telegraphic communication with India, and reducing the charge for

for Telegraphic messages have for some time past engaged and are still engaging the earnest attention of all the Governments and administrations concerned, and there is good reason to hope that greatly increased efficiency and economy will shortly be the result. Proposals have also been received by Sir Stafford Northcote with respect to the formation of additional lines of telegraph in the direction of the one more particularly referred to in the Memorial, but in reply to these, while expressing the satisfaction it would afford to the Indian Government to see the enterprizes in question carried out, he has felt it his duty to decline on behalf of that Government to extend to them pecuniary support.

J. S. Fleming, Esq.

I am &c.
(signed) *Clinton.*

TELEGRAPHIC COMMUNICATION
(EAST INDIA).

COPY of Two MEMORIALS to the Governor General from the Commercial Communities of *Calcutta* and *Bombay*, on the Subject of TELEGRAPHIC COMMUNICATIONS, together with other DESPATCHES and PAPERS on the same Subject.

(*Sir Stafford Northcote.*)

Ordered, by The House of Commons, to be Printed,
14 May 1868.

[*Price 10 d.*]

269.

Under 4 o.

COPY OF A COMMUNICATION

FROM

BARON BAUDE,

RELATIVE TO

TELEGRAPHIC COMMUNICATION

BETWEEN

GREAT BRITAIN, EGYPT, & INDIA.

*Presented to the House of Commons by Command of Her Majesty, in pursuance of their
Address dated December 3, 1867.*

LONDON:

PRINTED BY HARRISON AND SONS.

RETURN to an Address of the Honourable the House of Commons, dated December 3, 1867;

for—

“Copy of a Communication from Baron Baude, dated the 6th day of November, 1867, to the Foreign Office, relative to the Evidence given before the Select Committee of the House of Commons on Telegraphic Communications between Great Britain, Egypt, and India.”

Baron Baude to Lord Stanley.—(Received November 11.)

M. le Ministre,

Londres, le 6 Novembre, 1867.

M. LE MINISTRE de l'Intérieur, à Paris, vient seulement d'avoir connaissance d'une déposition qui aurait été faite, le 24 Avril, 1866, par Mr. Glass, devant une Commission de la Chambre des Communes chargée d'étudier la question des communications postales, télégraphiques, et maritimes, entre l'Angleterre d'une part, les Indes et l'Egypte de l'autre.

Il résulterait de cette déposition, dont j'ai l'honneur de transmettre à votre Excellence une copie ci-annexée, que la transmission des dépêches officielles échangées à travers la France entre le Gouvernement Britannique et ses Agents Diplomatiques ne s'effectuait, à Paris, qu'avec l'assentiment du Directeur-Général des Lignes Télégraphiques de l'Empire, et que les copies de ces dépêches resteraient exposées dans le Cabinet de ce fonctionnaire sans qu'il en fût fait aucun mystère.

M. le Marquis de la Valette déclare que ces assertions sont absolument sans fondement; et comme elles pourraient avoir pour résultat d'égarer l'opinion publique, le Gouvernement de l'Empereur croirait désirable qu'elles fussent formellement démenties.

En portant cette déclaration à la connaissance de votre Excellence, je lui serais reconnaissant de vouloir bien me faire savoir la suite qu'elle croirait devoir lui donner.

Veuillez, &c.

(Signé) B^N. BAUDE.

(Translation.)

M. le Ministre,

London, November 6, 1867.

THE Minister for the Interior at Paris has only just been made acquainted with a statement made on the 24th of April, 1866, by Mr. Glass, before a Committee of the House of Commons, charged with the duty of examining into the question of postal, telegraphic, and maritime communications between England on the one hand, and India and Egypt on the other.

It would appear from this statement, copy of which I have the honour to transmit to your Excellency herewith, that the transmission of official despatches, exchanged through France between the British Government and their Diplomatic Agents can only be effected subject to the consent of the Imperial Director-General of Telegraphic Lines; and that copies of these despatches remain open in the office of this functionary, without any secret being made of the matter.

M. le Marquis de la Valette declares that these assertions are absolutely without foundation; and as their result might tend to lead public opinion astray, the Imperial Government consider it desirable that they should be formally denied.

In bringing this declaration to the notice of your Excellency, I shall be much obliged if you will be good enough to acquaint me with the course you may in consequence think proper to adopt.

Accept, &c.

(Signed) B^N. BAUDE.

Inclosure.

Testimony of R. A. Glass, Esq. (Glass, Elliott and Co.), before a Select Committee of the House of Commons, April 24, 1866.

Question 1640. I UNDERSTAND you to say, that looking to the fact of the French service being good of its kind, to the fact that you have made arrangements with the Italian Government for having a wire of your own, and operators of your own, in the dominions of the King of Italy, and to the fact that there is now a communication from Sicily by way of Malta and Bnghazi to Alexandria, we may assume that for all practical purposes there is a prospect of a good and continuous communication by telegraph with Egypt?—*A.* No doubt, subject of course to certain objections. I may state, that although the telegraphic system in France, as regards the administration of it, is very good, yet we must not shut our eyes to the fact that there is a species of espionage there which is astonishing to English people.

Q. 1641. What is the state of the telegraphic service at the present moment in Egypt generally?—*A.* At present in Egypt our Company have the lease of the short line from Alexandria to Suez, and before the line was open to India viâ Constantinople we received a great many messages from India to Suez.

Q. 1683. Has any proposition that you are aware of, ever been made to the French Government for the purpose of giving any Company here the power of transmitting messages through France?—*A.* I am not aware of it; but I should think such a thing would fail as a matter of course. I have had a great deal of business with the French Government, and have at the present time, and I know that they will not allow of anything that interferes with them, that is to say, they will give no one power in France but themselves.

Q. 1684. They take copies, do they not, of all messages?—*A.* I may speak with some certainty upon that; I was surprised at being shown in the Director-General's office in Paris, messages of our own between Alexandria and England to Her Majesty's Government from their Agents; it was made no secret of. Of course it was an extraordinary thing to show me a message from the Government Agents in Alexandria to the Government at home, but that is their practice. I may state, in anything connected with the telegraph and other matters in which they think they have an interest, the Director-General has copies of all messages before him as they arrive; and I believe they do not go forward until he gives his assent.

Q. 1708. You could not go from Ragusa direct to Bnghazi, could you?—*A.* Yes, we could do so; there is no difficulty in laying such a line, and it is part of the scheme.

Q. 1709. By which you would be independent of France?—*A.* Yes.

Q. 1710. And of French espionage?—Yes; there are three routes, one viâ Ragusa, another viâ Paris and Italy, and another the original route, which ultimately we must come to, no doubt, from Falmouth to Gibraltar, and from Gibraltar to Malta; but at present the most inexpensive route would be viâ this direct line through Italy or viâ Ragusa.

Q. 1743. For what time have you the exclusive use of the wire?—*A.* For forty years.

Q. 1744. For working that wire do you employ your own clerks?—*A.* Yes.

Q. 1745. There is no interference whatever on the part of the Italian Government?—*A.* No.

Q. 1746. Have you applied to France to see whether you could make similar arrangement with the French Government?—*A.* We have not done that.

Q. 1747. Do you not think it advisable that you should do so?—*A.* I think it is advisable; but the French Government are difficult to approach except through the English Government. I should fail in getting it as an individual.

Q. 1748. Have you tried whether you could get it through the intervention of the British Government?—*A.* Not at present.

201 61 2 COMMUNICATION FROM DELOU
Baude, relative to Telegraphic Com-
munication between Great Britain,
Egypt, and India.

*Presented to the House of Commons, by Command
of Her Majesty, in pursuance of their Address
dated December 3, 1867.*

[Price $\frac{1}{2}d.$]

LONDON:

PRINTED BY HARRISON AND SONS.

TELEGRAPHIC COMMUNICATION (EAST INDIA, &c.)

RETURN to an Address of the Honourable The House of Commons,
dated 5 May 1868;—for,

“COPY of CORRESPONDENCE and PAPERS relating to the Establishment of
TELEGRAPHIC COMMUNICATION between *India*, *Singapore*, *China*, and
Australia, since the 21st day of February 1865 (in continuation of Papers
communicated in the Session of 1865).”

India Office, }
15 June 1868. }

W. T. THORNTON,
Secretary, Public Works Department.

(*Mr. Edward Hamilton.*)

Ordered, by The House of Commons, to be Printed,
16 June 1868.





COPY of CORRESPONDENCE and PAPERS relating to the Establishment of TELEGRAPHIC COMMUNICATION between *India, Singapore, China, and Australia*, since the 21st day of February 1865 (in continuation of Papers communicated in the Session of 1865).

Sir *F. Rogers* to Mr. *G. A. Hamilton*.

Sir,

Downing-street, 4 April 1865.

I AM directed by Mr. Secretary Cardwell to transmit to you, for the information of the Lords Commissioners of the Treasury, a copy of a Despatch from the Governor of Queensland, reporting on the progress of the Electric telegraph in that Colony.

No. 3, 5 Jan. 1865.

G. A. Hamilton, Esq.,
&c. &c. &c.

I am, &c.
(signed) *Frederic Rogers*.

(Enclosure.)

Governor Sir *G. F. Bowen* to Mr. Secretary *Cardwell*.

Sir,

Government House, Brisbane, Queensland,
5 January 1865.

WITH reference to previous Despatches respecting the progress of the Electric telegraph in this Colony I have the honour to report that communication was yesterday opened between the seat of Government at Brisbane and Rockhampton, the chief town in the northern districts of Queensland. The intermediate towns of Toowoomba, Dolby, Gayndah, Maryborough, and Gladstone, are also now in direct connection with Brisbane, Sydney, Melbourne, Adelaide, and all the other centres of population in Australia.

No. 26, of 14 March 1860.
No. 38, of 26 April 1860.
No. 64, of 15 Nov. 1862.
No. 52, of 2 Oct. 1863.

2. The Queensland Parliament has already made provision for the further extension of the Electric telegraph from Rockhampton, on the one hand to the inland town of Clermont, the centre of the Peak Downs Gold Fields; and, on the other hand, to the seaport town of Bowen at Port Denison, in Edgecombe Bay, in about the 20th degree of south latitude. The works are being pushed on with vigour on both these new lines; and it is expected that they will be completed in about six months from the present date; certainly before the close of the current year 1865.

3. I am requested by my constitutional advisers to state that, so soon as there shall appear a reasonable prospect of the international telegraph reaching the northern coast of Australia, the Parliament of Queensland will be prepared to extend at its sole cost, the intercolonial line from either Clermont or Bowen, to meet the international line either at the head of the Gulf of Carpentaria, or at any other point which may be judged more convenient. Perhaps it may be finally decided to bring the submarine line from the Dutch island of Isinor to the new settlement recently founded by the Government of South Australia at Adam Bay. In that case, Queensland will be prepared to carry the wires to any point on the 138th meridian of longitude (our north-western boundary) which may be agreed upon between this Colony and South Australia.

4. An idea has been started of carrying the Electric telegraph from Adam Bay to Adelaide, across the centre of the Australian continent; but the best informed explorers and geographers consider any scheme of that kind to be impracticable, at all events for many years to come. The centre of this continent is still, for the most part, an unknown wilderness; whereas almost the entire territory, between Rockhampton and the head of the Gulf of Carpentaria, is already occupied by the sheep and cattle stations of the Queenslanders. In the course of the next 12 months the whole of this country will be settled. It seems manifest, therefore, that on every consideration of economy and security, as also in the general interests of colonisation, the international telegraph should be brought to some point on the northern coast of Australia, and thus meet the intercolonial line in Queensland.

5. From recent discussions in the public press in England respecting the extension of the Electric telegraph from India to Australia, it appears that the present state of the question in general, and particularly the progress of settlement in Northern Queensland along the

proposed telegraphic line, are very imperfectly known in the mother country. I venture, therefore, to submit that it would be well to give publicity to the information contained in this Despatch by forwarding a copy of it to the Royal Geographical Society, and (if you should further see fit) by laying it before the Imperial Parliament, in continuation of the Papers on the same subject ordered by the House of Commons to be printed during the Session of 1864.

The Right Hon. Edward Cardwell, M. P.
&c. &c. &c.

I have, &c.
(signed) *G. F. Bowen.*

Sir *F. Rogers* to the Secretary to the Treasury and the Secretary to the Board of Trade.

Sir,

Downing-street, 29 January 1866.

I AM directed by Mr. Secretary Cardwell to transmit to you, for the consideration of the Lords Commissioners of the Treasury, Lords of the Committee of Privy Council for Trade, a copy of a Despatch from the officer administering the government of Hong Kong respecting a scheme for laying a submarine cable to that Colony.

Mr. Cardwell apprehends that the concession to the projectors of this scheme of a monopoly for a fixed term of years could not be allowed.

H. L. 162 of 1858.

I enclose the copy of a Parliamentary Paper relating to this subject, and I am to refer you especially to the Despatches printed in pp. 31, 33, and 34.

The Secretary to the Treasury,
and the Secretary to the Board of Trade.

I am, &c.
(signed) *F. Rogers.*

(No. 185.—Commercial.)

Acting Governor *Mercer* to Mr. *Cardwell*.

Sir,

Hong Kong, 25 November 1865.

I HAVE the honour to report that during the past week I have given several interviews to a gentleman sent out here to make inquiry as to the prospects of an intended company for laying a submarine cable.

2. This gentleman, Commander Forbes, R.N., was desirous of knowing what assistance would be given by the Government of Hong Kong to the proposed undertaking. He stated that it was not improbable that both the Singapore Government and the French Government at Laigon would support the scheme by pecuniary contribution. Such contribution, he suggested, might be made by us, and in addition a concession of the monopoly of the line for a fixed term of years.

3. Fully sensible of the advantages to this Colony, and to the general commerce of China, which the scheme promised, I pointed out that the place for landing the cable would be on the south coast of the island, to which he assented and I undertook that a grant of land there would be readily given by the Government.

4. There is no spot on the south side where land is of any value, except the Aberdeen Dock and its immediate neighbourhood.

5. But as regarded the contribution, I said that as Captain Forbes admitted the very natural and necessary design to carry the cable to Shanghai, the north of China and Japan, I doubted whether the particular benefit to Hong Kong was so great as to justify an apportionment of the public money of this Colony, unless other parties interested contributed also, as the Chinese and Japanese Governments, and the Imperial Government of Great Britain, the two first profiting largely by their foreign trade, and the last drawing an enormous revenue from that of China and Japan, equal to ten times the Imperial expenditure incurred on all services employed in these countries.

6. I remarked, however, that if the British Government at Singapore, and the French

French at Laigon, were willing to contribute, the fact would go far to induce this Government to offer similar assistance.

7. On the subject of the monopoly for a term of years, I mentioned to Captain Forbes that there were legal points to be considered in connection with private shore rights, which private rights might endanger the security of the monopoly.

8. Captain Forbes has been in communication, which he represents as satisfactory, with Mr. Hart, who succeeded Mr. Lay as Inspector General of Maritime Customs in the service of the Emperor of China, it being advisable, in Captain Forbes' opinion, to make certain of the sanction of the Imperial Government of China; and this it may be, in certain places, where the landing of the cable will necessarily be on Government ground; but I have pointed out to Captain Forbes that it would be a mistake to ask Chinese sanction, as he proposed to do, for laying it down in the high sea adjacent to the Chinese coast.

9. Captain Forbes is, I believe, an agent of Mr. Ponder, M.P., who has interested himself in this matter.

10. The three points then are these: as to the ground, which on the south side of the island can easily be given, land there, though useful for the particular purpose, being otherwise valueless: as to the contribution; on which I should wish an expression of opinion from Her Majesty's Government; but I should not propose a larger sum than 5,000 £., as it appears to me that the promoters want hardly more than a practical recognition of their scheme by the Colonial Government: and, lastly, as to the monopoly, which I look upon as a minor matter, and one of which the arrangement, one way or the other, need not interfere with the undertaking, if seriously contemplated.

£.5,000.

The Right Hon. Edward Cardwell, M.P., I have, &c.
(signed) W. T. Mercer.
&c. &c. &c.

Mr. Hamilton to Sir F. Rogers.

Sir, Treasury Chambers, 10 February 1866.

WITH reference to your letter of the 29th ultimo, transmitting a copy of a Despatch from the officer administering the Government of Hong Kong, respecting a scheme for laying a submarine cable to that Colony, I am directed by the Lords Commissioners of Her Majesty's Treasury to acquaint you that my Lords concur in opinion with Mr. Secretary Cardwell, that it is not desirable that any concession should be granted by the Government of Hong Kong to the proposed Company for laying a submarine cable in the China seas. My Lords consider that any arrangement with the company should be limited to a grant for a short term of years of a place for landing the cable on the south coast of the island (exclusive of Aberdeen Dock and its immediate neighbourhood), in return for which it might be agreed that Government messages should have priority.

My Lords are not aware what the "private shore rights" may be to which the Acting Governor alludes in his Despatch; the foreshore of the island being vested, as my Lords presume, in the Crown.

Sir Frederic Rogers, Bart., I am, &c.
(signed) Geo. A. Hamilton.
&c. &c. &c.

(Hong Kong.—No. 25.)

Mr. Cardwell to Governor Sir R. G. MacDonnell.

Sir, Downing-street, 16 February 1866.

WITH reference to Mr. Mercer's Despatch, No. 185, of the 25th of November, respecting a scheme which had been brought under his notice for laying a submarine cable to Hong Kong, I have the honour to enclose, for your information and guidance, a copy of a letter addressed, by my desire, to the Lords Commissioners

29 Jan. 1866.

10 Feb. 1866.
H.L. 162 of 1858.

missioners of the Treasury on the subject, together with a copy of the letter which has been received in reply.

I also enclose, for your information, a copy of a Parliamentary Paper relating to this subject, and I would refer you especially to the Despatches printed in pp. 31, 33, and 34.

Governor Sir R. G. MacDonnell, c.B.,
&c. &c. &c.

I have, &c.
(signed) *Edward Cardwell.*

(No. 224.)

Sir *J. Emerson Tennent* to the Under Secretary of State for the Colonies.

Office of Committee of Privy Council for Trade,
Whitehall, 13 February 1866.

Sir,

I AM directed by the Lords of the Committee of Privy Council for Trade to acknowledge the receipt of your letter of the 29th ultimo, transmitting, by direction of Mr. Secretary Cardwell, for the consideration of this Board, copy of a Despatch from the officer administering the Government of Hong Kong, respecting a scheme for laying a submarine cable to connect the British settlements in China and Japan.

It appears from these papers that the conditions asked for by the telegraph company for laying the telegraphic line are :—

1. A pecuniary subvention.
2. A grant of land as sites for buildings, &c.
3. A monopoly of the service for a term of years.

In reply, I am to request that you will inform Mr. Cardwell that the two first conditions are such as may be decided by the Colonial and Home Governments without apparent difficulty ; but, as regards the concession of a monopoly for a period, however short, my Lords entirely concur in the opinion of Mr. Cardwell, that it is one that should on no account be made.

The Under Secretary of State,
Colonial Office.

I have, &c.
(signed) *J. Emerson Tennent.*

(Hong Kong.—No. 29.)

Mr. *Cardwell* to Sir *R. G. MacDonnell*.

Sir,

Downing-street, 22 February 1866.

WITH reference to my Despatch, No. 25, of the 16th instant, I have the honour to transmit to you, for your information, the copy of a letter from the Board of Trade respecting the scheme for laying a submarine cable to connect the British settlements in China and Japan.

Governor Sir R. G. MacDonnell, c.B.,
&c. &c. &c.

I have, &c.
(signed) *Edward Cardwell.*

Commander *Forbes* to the Secretary of State for the Colonies.

44, Charing Cross, London,
26 February 1866.

Sir,

WITH reference to a Despatch from the Acting Governor of Hong Kong, relative to proposals which I had the honour to make to him on the subject of landing submarine cables on that island, I have the honour to offer the following observations, which I trust may receive your consideration.

I have reason to believe that his Excellency, the Acting Governor, inferred from

from my conversations on the subject, that I asked for an absolute monopoly of landing submarine cables on that island.

What I wished his Excellency to understand was, that I asked for a limited right, for a specified number of years.

Viz.: A concession of the right to land submarine cables on that island for a period of, say, 25 years; such right to be granted under the following conditions: That within four years from date, the island of Hong Kong is to be connected with Singapore by a submarine cable, and that such right should lapse if the said line was at any time out of working order more than four consecutive years.

I also asked his Excellency to grant a small annual subsidy to the line whilst in working order; and likewise to allot a convenient locality at the back of the island for landing the cable.

In return for the small subsidy, I proposed to give the Government the priority in sending messages. As regards the grant of land, it was asked for solely with a view of demonstrating that the undertaking had the countenance and support of the local Government, as nearly the entire water frontage at the back of Hong Kong is perfectly unsaleable.

Hoping that it may be consistent with public interests to grant me such rights, more especially when the importance of connecting Hong Kong with Europe is taken into consideration,

The Right Hon. the Secretary of State
for the Colonies.

I have, &c.
(signed) C. Forbes.

Mr. Forster to Commander Forbes.

Sir, Downing-street, 10 March 1866.

I AM directed by Mr. Secretary Cardwell to acknowledge the receipt of your letter of the 26th ultimo, in explanation of the conditions under which, on behalf of a proposed company, you had applied to the Government of Hong Kong for permission to lay down in that Colony a submarine cable to connect the British settlements in China and Japan.

I am to inform you, in reply, that no monopoly can be conceded, even for a limited time to any company formed with this object; but that any reasonable proposals for facilities not attended by monopoly will be favourably considered.

Commander Forbes, R.N.

I am, &c.
(signed) W. G. Forster.

Mr. Harvey to Lord Carnarvon.

Care of Messrs. George May & Co.,
32, Finsbury Circus, City, London,
6 August 1866.

My Lord,

IN the years 1864 and 1865 I organised and despatched from Melbourne, in Victoria, two expeditions, consisting of four ships carrying about 250 souls, 100 horses, 50 cattle, and 7,500 sheep, to be landed on the north-west coast of Australia, within the boundary of the Colony of Western Australia.

The first of these expeditions, comprising about two-thirds of the stated numbers, landed at Camden Harbour in south latitude $15^{\circ} 30'$, east longitude $124^{\circ} 30'$, but partly from the excessive dryness of the season, partly from the difficult nature of the country immediately bordering on the landing-place, and partly from other causes, the expedition proved unsuccessful, and although receiving adequate support from the Government of Western Australia, the settlement there has been now some time abandoned.

The second expedition, originally intended also for Camden Harbour, proceeded to Nicol Bay (sometimes called Tientzin Harbour) in south latitude $20^{\circ} 40'$, east longitude $116^{\circ} 40'$, where every success in health and increase has attended the persons and stock, and to this point the Resident (Mr. Sholl), sent to Camden Harbour by the West Australian Government, has been removed, and has pro-

claimed the neighbouring coast a port of entry under the name of Port Walcott. This locality is attracting considerable attention in the different Australian Colonies.

One of my ultimate objects in organising these expeditions was the eventual carrying out of electric communication between Britain and Australia through the points named, which I am prepared to show is the most natural, easiest, and cheapest route for such communication; but, in an unoccupied country like Western Australia, sufficient encouragement is necessary to induce the enterprise. In this view I addressed the Government of Western Australia, before leaving Melbourne for this country, to push the enterprise, and I have the honour now to enclose copy of the reply of that Government to my proposals.

I crave for this reply your best consideration, and an early statement of the course which Her Majesty's Government consider it advisable to adopt, in answer to my proposals to the Government of Western Australia.

When I receive this I shall be prepared to lay before your Lordship a plan for carrying out effective settlement at the important locality of Camden Harbour, and on which I am ready to expend 100,000 £. on receiving a free grant there of 100,000 acres.

Awaiting a communication from your Lordship,

The Earl of Carnarvon,
&c. &c. &c.

I have, &c.
(signed) *William Harvey.*

(Enclosure.)

(No. 39.—553.)

Mr. Barlee to Mr. Harvey.

Western Australia, Colonial Secretary's Office,
Perth, 18th December 1865.

Sir,

I HAVE the honour to acknowledge your letter of the 23rd ultimo on the subject of the establishment of telegraphic communication from Europe to Australia by availing of the facilities now nearly complete continuously from London to the east end of the island of Java, and submitting that in furtherance of such an undertaking the Government of Western Australia should either grant territorial concessions for a period of 21 years of stations of forty thousand (40,000) acres at distances of not more than fifty miles apart, commencing at the South Australian boundary on the Great Australian Bight and following the line to its terminus at Nickol Bay, or guarantee interest at the rate of eight per cent. per annum on the capital of the company you hope to establish.

To these proposals I am instructed by his Excellency, Governor Hampton, to state that he has no authority, without reference to Her Majesty's Principal Secretary of State for the Colonies, to grant territorial concessions such as you have suggested, nor could he sanction the guarantee of interest on the capital required for such an undertaking.

He, however, desires me to add that it will afford him pleasure when your plans are more matured, to give full consideration to any scheme that may be submitted, and to afford every reasonable facility that may be in his power in furtherance of so important and desirable a work.

William Harvey, Esq.

I have, &c.
(signed) *Fred. P. Barlee.*

Mr. Elliot to the Emigration Commissioners.

Gentlemen,

Downing-street, 15 August 1866.

I AM directed by the Earl of Carnarvon to transmit to you for your report a copy of a letter from Mr. William Harvey, requesting that a grant of 100,000 acres of land in Western Australia may be made to him, in furtherance of a scheme of telegraphic communication between Europe and Australia which he proposes to establish.

The Emigration Commissioners.

I am, &c.
(signed) *T. F. Elliot.*

6 August.

Mr. S. Walcot to Mr. T. F. Elliot.

Sir,

Emigration Office, 10 September 1866.

I HAVE to acknowledge your letter of the 15th ultimo, with a copy of a letter from Mr. William Harvey, requesting the assistance of the Government in establishing telegraphic communication between this country and Australia, and a free grant of 100,000 acres of land at Camden Harbour, Western Australia, for the purpose of forming a settlement there.

2. Mr. Harvey's letter to Lord Carnarvon, and its enclosures, disclose so little information, that it is impossible from them to form an opinion on his telegraphic scheme. I requested, therefore, an interview with him for the purpose of obtaining further details on several points. These, at my instance, he embodied in a letter, of which the enclosed is a copy. But before noticing his project, it may be convenient to glance at the existing modes of communication with India and Australia.

3. The most recent and reliable information on the subject is to be found in a Report of a Select Committee of the House of Commons on East India Communications, made in July last, which has just been printed, but, without the evidence. From this Report it appears that there are three postal communications with the East Indies in each month; one, by the French line of the *Messageries Impériales* to Singapore, and two by the Peninsular and Oriental Line to Bombay and Calcutta. The Calcutta mail, which leaves Southampton on the 20th, and Marseilles on the 28th of each month, carries, also, the Australian mails, which are transferred at Point de Galle to a branch steamer for Western Australia, Melbourne, and Sydney. This branch steamer leaves Point de Galle about the 22nd of the next month, and arrives at King George's Sound, Western Australia, about the 5th of the following or third month, at Melbourne about the 10th, and Sydney about the 14th. The English mail, therefore, reaches King George's Sound in about 46 days from Southampton, or 38 days from Marseilles, and Sydney, in about 55 days from Southampton, and 47 from Marseilles.

The Peninsular and Oriental Company are bound by their contract with the Government to perform the journey between Point-de-Galle and Sydney in 516 hours, or 21½ days. Besides these lines, there is a monthly line of mail steamers from Panama to New Zealand and Sydney, which is to run in connection with the Royal Mail Steam Packet Company. The service will commence on the 2nd of next month, and is to be performed in 49 days to Wellington, and 57 days to Sydney. But it is only the French and the Peninsular and Oriental Lines that enter into Mr. Harvey's plan.

4. The telegraphic communication with the East is by two routes: the Turkish, the one most used, and the Russian. The Turkish line runs through Constantinople and Bagdad, either to Fao, at the head of the Persian Gulf, or through Teheran, over the internal Persian system, to Bushire, lower down in the Gulf. From Fao and Bushire the message is transmitted by the same submarine cable to Kurrachee. The Russian line passes through Tiflis to Tuepha, on the Arras, and thence by Teheran over the Persian system to Bushire, and so on to Kurrachee. From Kurrachee the telegraphic wires spread through India to Rangoon, where the Indian system ends.

5. The Dutch Government send steamers to meet the Peninsular and Oriental steamers, and, collecting at Bombay, Point-de-Galle, and Singapore, all the postal and telegraphic information destined for their possessions, carry it three times a month to Batavia, whence it is distributed through the Island of Java by means of a telegraphic service, which has been some years in operation. By these means the postal transit, Mr. Harvey states, between London and Batavia, *via* Marseilles, occupies 36 days, which, by telegram to Point-de-Galle, may be abridged to 11 days, and when Rangoon and Batavia are in electric communion, to 36 hours.

6. It is with this state of things that Mr. Harvey undertakes to deal. He proposes to take advantage of the Batavian postal and telegraphic systems, and to forward all news intended for Australia from Tyliatjop, a post midway on the south coast of Java, by swift steamers, in three days, to the newly named Port

Walcott, or Nichol Bay, on the north-west coast of Western Australia (116°40' east longitude, 20°40' south latitude), and thence to the rest of Australia, over the telegraphic line which he has it in contemplation to construct, through Western Australia. According to his calculation (I think, however, the steamers would take more than three days between Tyliatjop and Port Walcott), London would thus be brought within 14 days of Australia, and Australia would receive its European news three times instead of only once a month, as at present.

7. The proposed line is to commence at Port Walcott, and passing by Champion Bay, Perth, and King George's Sound, is to proceed to the boundary of South Australia, in the Great Australian Bight, about south latitude 31°30', and east longitude 129°; a distance of about 2,200 miles. There Mr. Harvey's operations end. But he states that there is already electric communication between Melbourne and Port Lincoln, in South Australia, and that it would only require a connecting wire between Port Lincoln and the terminus of the new line on the South Australian boundary, a distance of about 300 miles, to complete the Australian telegraphic system. If the electric current between London and Australia were unbroken, the communication between them could be accomplished, Mr. Harvey affirms, in about 36 hours, instead of 14 days, as his present plan contemplates. But, assuming the present plan to be carried out, there would be three gaps in the course; one of about 1,800 or 1,900 miles, between Rangoon and Java; another of about 1,000 miles, between Java and Western Australia; and the third of about 300 miles, between the terminus of the proposed line and Port Lincoln. With these gaps, Mr. Harvey does not intend to meddle. His plan, for the present at least, is confined to bridging over the gap between Java and Port Walcott, by means of swift steamers, and to constructing a land line of telegraph within Western Australia. He does not state what is to take place when he reaches the South Australian boundary; but there is little doubt that if he carries out his project, the line would be continued by himself, or others, to Port Lincoln. He proposes to have 44 stations, at an average distance of 50 miles apart; and he estimated, on the authority of Mr. McGowan, the superintendent of the Victoria lines, that the probable cost of making the line will be about 60 £ the mile, or 132,000 £ for the 2,200 miles. The Victoria lines, which are 2,275 miles in length, with 78 stations, cost, up to the latest returns in 1863, and under adverse circumstances, which it is alleged do not apply in the present case, 204,137 £, or at the rate of nearly 81 £ per mile. But Mr. Harvey admits that it would not be prudent to enter upon his scheme with a less capital than 250,000 £. As he could not undertake the work single-handed, he proposes to form a company for the purpose; and to enable him to do this he asks the assistance of the Government, in the shape either of a guarantee of interest on the capital expended, of at the rate of eight per cent. per annum, or territorial concessions.

8. The guaranteed interest on 250,000 £, would amount to a yearly subsidy of 20,000 £; but as the Government have, in another case, refused to introduce the principal of subsidising, or guaranteeing, telegraphic lines on land, that part of the scheme would not, I presume, be entertained by Lord Carnarvon, and need not, therefore, be further considered.

9. The territorial concession demanded, is a grant, for a period of 21 years, of a block of 40,000 acres at each of the 44 stations on the line, or an aggregate of 1,760,000 acres. Mr. Harvey, on being pressed by me on this point, maintained that it is the smallest quantity that, under the circumstances, would be compatible with the success of the undertaking. In that part of Australia it requires, he alleges, 15 acres to support a sheep.

10. The principle of assisting undertakings of great public and general utility by free grants of land, has been recognised by this Government in recent instances. There can be no doubt of the great public advantage which would accrue from a more frequent and speedy communication between the United Kingdom and Australia. The value of the imports into this country from Australia last year, exclusive of the precious metals, was 10,283,113 £, and of the exports to Australia, 13,352,357 £.

This great and growing commerce between the two countries is equal to 5·4 per cent. of the whole commerce of the United Kingdom with all the world, and

and affords some measure of the correspondence and mercantile operations incident to its transaction, and of the importance of increased facilities for its development."

11. The Select Committee on East India Communications, already referred to, accordingly report (paragraph 58) that proposals, at various times, have been made to Her Majesty's Government to connect, telegraphically, Australia with the Indian system at Rangoon, but that no arrangement had yet been found practicable, notwithstanding the willingness of the Colonies (as appears from the evidence of Sir Charles Nicholson) to give a guarantee, to the extent of 35,000*l.* per annum, for the purpose. They state that the Government of Holland had expressed its readiness to afford material aid in the construction of a line to bring their Eastern dependencies into communication with Europe, and that the French Government is reported, also, to be willing to assist in the formation of a line to connect Saigon with Singapore. They add that, according to the best information attainable, neither the depths of water, nor the distances between one station and another, present any difficulty as regards the construction of a line between Rangoon, Singapore, and the Australian Colonies, and amongst the recommendations with which the Report concludes are three, which point more especially to Australia.

(1.) That the Government "should take into their early consideration the arrangements to be made in consequence of the proposed separation of the Indian service for maintaining a half-monthly service to China, and a monthly, or four-weekly service to Australia, having regard to any facilities which may be afforded by the line of the Messageries Imperiales from Marseilles."

(2.) That the proposition made to the Committee "for the establishment of a direct communication between England and Bombay, by way of Aden, on the principle of a line practically under one management and responsibility, between London and the Indian Presidencies in the first instance, and afterwards with China and the Australian Colonies, is deserving of serious consideration, and such reasonable support as the influence of Her Majesty's Government may be able to bring to its aid." And,

(3.) "That the magnitude of the interests involved in the trade in this country with China and Australia, and the rapidly increasing development of the Colonies in population, in commerce, and in the various elements of national greatness, render it desirable that arrangements should be made to bring these communities within the reach of telegraphic communication with Europe."

12. Under these circumstances, I presume that Lord Carnarvon will be prepared to consider Mr. Harvey's proposal for some territorial concession in aid of his scheme. In that case the main question will be the quantity of land to be granted, and the conditions to be attached to the grant. The quantity asked for is 1,760,000 acres, or 2,750 square miles, an area larger than that of Lincolnshire (2,611 square miles), the largest county in England after Yorkshire. This would be at the rate of 800 acres, or $1\frac{1}{4}$ square mile for each mile of the intended line of telegraph.

13. Looking at the nature and circumstances of the country, and at the concessions for railway purposes made in the United States, and recently by the Duke of Newcastle, to the promoters of the telegraphic line between Canada and British Columbia, the quantity of land asked for by Mr. Harvey cannot be said to be extravagant. In the United States it is not unusual, Mr. Harvey asserts, and I believe correctly, to concede one square mile and upwards on each side of the intended line. This is about double the quantity he asks for. In the case of the Canada and British Columbia project, the grants promised were five square miles, or 3,200 acres for every mile of telegraphic line passing over Crown land, situated beyond the limits of Canada, British Columbia, or the Hudson Bay Company's territory. In that case, too, the grant was to be in perpetuity, but in the present case the grant would be only for a term of 21 years. The land is, at present, entirely valueless, nor is it likely to be wanted for purposes of settlement for many years to come. But should Lord Carnarvon think fit to entertain the principle of Mr. Harvey's proposal, I presume that before any decision be taken, the question as to the quantity of land to be conceded will be referred for the report of the Governor of Western Australia. Should a grant be finally decided on, the conditions to be attached to it would have to be considered.

It would obviously be advisable to require that the undertaking should be commenced and finished within specified time, that the grant should not issue until the line is finished, and certified to be in good working order; that the land should be taken as nearly as possible in square blocks, at the several stations in the unsettled districts, but, of course, not in the settled districts or their immediate neighbourhood; that any portion of the land which might, in progress of time, be wanted for the purposes of settlement, should be given up to the Government, on a six month's notice; that the land, or the telegraph line, shall not be alienated without the consent of the Government; that at the end of the 21 years, or on the failure, for a specified period, to keep the line in efficient working order, the land and the line shall revert to and become the property of the Crown, without compensation.

14. Amongst the other subordinate questions that would ultimately have to be considered, would be the resources and capability of the company for carrying out the undertaking to a successful issue; priority in the transmission of Government messages, and the charges to be made to the public for the use of the line. On this latter point Mr. Harvey's proposal seems not an unfair one, namely, that the scale of charges for messages should be left to be settled by arbitration, on the completion of the undertaking with reference to its cost.

15. Mr. Harvey would, if wished, undertake to lay a submarine cable between Port Walcott and Java, when the latter place shall be in electric communication with Europe; but, in that case, as he estimates the additional expense at about 300,000 £., he requires a pecuniary guarantee beyond the territorial concession for which he now stipulates. For the reason above mentioned, that would be an inadmissible condition. He adds that, on learning that his application for a territorial concession is acceded to, he and his friends will submit the names of the Company proposed to be formed for efficiently carrying out the undertaking.

16. Finally, he applies for an absolute grant in fee, of 100,000 acres of land at Camden Harbour, on which he offers to expend 100,000 £. in carrying out an effective settlement in that locality. This application, as it appears to me, is coupled with the telegraphic scheme, in order to escape the operation of the general rule of the Government against making free grants of land, except for the promotion of public objects of general utility. The concession at Camden Harbour has no necessary connection that I can see with the telegraphic scheme; and I presume that Lord Carnarvon will not assent to this part of the application. Free grants of land have already proved the bane of Western Australia; and there seems no sufficient reason why an exception should be made in Mr. Harvey's favour from the established regulations for the disposal, for the purposes of settlement, of the waste lands of the Crown in that Colony.

17. On the whole, as Mr. Harvey seeks no exclusive possession of Australian telegraphic communication, is willing to allow the charges for messages to be regulated by arbitration, and asks only for a 21-years' lease of land which, at present, is valueless, it appears to me that his proposal is worthy of being entertained; but that, before a final decision be taken, the question of the amount of land to be granted, and the conditions to be attached to the grant, should be referred for the consideration and report of the Governor of Western Australia. A reference to the Governor of South Australia might also be useful, as regards the question of a connecting link between the proposed line and the existing line in that Colony, so as to unite, telegraphically, all Australia.

T. Frederick Elliot, Esq.
&c. &c. &c.

I have, &c.
(signed) *S. Walcott.*

(Enclosures.)

Mr. William Harvey to Mr. S. Walcott.

Care of Messrs. George May & Co., 32, Finsbury Circus,
London, 30 August 1866.

Sir,

REFERRING to the interview I had with you at your office at your request on 21st current, in reference to a communication addressed by me to the Earl of Carnarvon, as Secretary for the British Colonies, dated the 6th current, on the subject of the Electric Telegraph in and to the Crown Colony of Western Australia, I have now the honour to enclose—

No. 1.—Copy of my letter to the West Australian Government, dated at Melbourne, 22nd November 1865, on the subject of Electric Communication.

No. 2.—Copy of the Reply of the Government of Western Australia, dated 18th December 1865.

No. 3.—Report from the Select Committee of the British House of Commons of 20th July 1866, on East Indian and Australian Communication, Postal and Telegraphic.

Note.—The Evidence to this Report is not yet printed.

No. 4.—Handbook of Information of the Peninsular and Oriental Steam Navigation Company.

On reference to paragraph 58 of No. 3, you will observe the early prospect, from the interests of the different foreign Governments concerned, of the completion of the telegraph line, now in working order from London to Rangoon, from that point to Singapore, and thence to Java. Within that island, electric communication has been complete for nearly 10 years.

My proposal to the West Australian Government, contemplated this independent early completion of continuous electric communication from London to Java; and in the meantime, the avail there of European and Indian intelligence every three days, viz., twice, monthly, by the Peninsular and Oriental steamers, as stated in No. 4, page 3, and once, monthly, by the French steamer of the “Messageries Imperiales,” to Singapore, each of which opportunities is met by a Dutch steamer from Batavia. The time occupied by *postal* transit by these means at present, between London and Batavia, *viâ* Marseilles, is 36 days; but this may be abridged, by telegram to Point-de-Galle, to be forwarded thence by steamer, to 11 days.

By my proposal to the West Australian Government, it was intended to receive the intelligence thus conveyed to Java, at the port of Tyliatjop, on the south coast of that island, in east longitude 190 degrees, and south latitude 7° 40', and convey it by swift steamer in three days to Port Walcott or Nickol Bay, on the north-west coast of Australia, in east-longitude 116° 40', south latitude 20° 40', thus placing all parts of Australia, for my plan would connect the whole of the lines now in existence there within 14 days of London three times every month. The completion of the electric telegraph from Rangoon to Java would, assuming that a telegram can be conveyed in 24 hours to Java from London, shorten this time to four days; and if an electric cable was successfully laid between Tyliatjop and Port Walcott, electric communication between London and all parts of Australia would be complete in about 36 hours.

At present the shortest postal course between London and Melbourne, *viâ* Marseilles, is 46 days, and *only once* every month, which time may be abridged by telegram to Point-de-Galle, to be sent forward by steamer, to 21 days. My plan would *at present* give Melbourne electric intelligence in 14 days from London *thrice every month*, and prospectively in 36 hours continuously, as already stated.

Now as to cost. It has been estimated that electric communication can be completed from Rangoon to Batavia for 620,000 *l.*, if a cable was adopted the whole way. But this would be very much cheapened by the adoption of a land line, except across the Straits of Malacca and Sunda; and this last is what the Dutch Government, it is understood, are prepared to sanction and support.

Again, it has been proposed by a company, some members of which were on the Commons Committee, and others gave evidence before it, to connect Batavia and Brisbane, in Queensland, by cable, passing from island to island, east of Java, to the Australian continent; thence across the mouth of the Gulf of Carpentaria to Cape York, and down the east coast of Australia to Brisbane. The estimated expenditure was 1,000,000 *l.*, and the benefits demanded were, an exclusive concession of the Australian line of telegraph for 30 years, a yearly grant from the Colonies of 50,000 *l.*, and power to charge 2 *s.* 6 *d.* per word for every 100 miles. The length of cable required was stated at 3,024 knots, the weight of main cable per knot 74 cwt., and shore ends, 154 cwt. per knot. Assuming the telegraphic distance from London to Brisbane to be 11,000 miles, a message of 20 words, at 2 *s.* 6 *d.* per word per 100 miles, would cost 275 *l.* The charge to America by the cable just laid is a little over 1 *s.* per word per 100 miles, and is considered very high.

The total outlay on the telegraphic lines in the Colony of Victoria, which belong to the Government to the latest complete return in 1863, was 204,137 *l.* 12 *s.* 7 *d.*

The number of stations were 78, and the number of miles open 2,275 $\frac{1}{2}$.

	£.	s.	d.
The working showed a cash revenue (being the business done for the public) during the year, of - - - - -	24,955	18	2
And Government work charged at same rates - - - - -	21,270	12	1
	£.	46,226	10 3

	£.	s.	d.
The working expenses for the same time were - - - - -	27,799	7	8
Leaving a nominal balance to the Government of - - - - -	18,427	2	7
	£.	46,226	10 3

The only telegraphic cable which has been hitherto laid in Australasia of any extent, was one connecting the Colony of Victoria, by way of King's Island across Bass's Straits, and in length about 100 miles. It was laid at the joint expense of the Victorian and Tasmanian Governments, and cost, when laid, very nearly 400 £. per mile; but it soon became useless.

I have given these data as to cost, &c. to enable you to judge more fully respecting my own proposal, as specified in Enclosure No. 1, and explained to yourself, and which, at your request, I now proceed more fully to elucidate.

The concession asked of the Western Australian Government required no exclusive possession of Australian telegraphic communication. It required no pecuniary grant from the Colonies, and it placed no fixed charge on messages but what would be considered equitable by arbitration, with reference to the cost, on completion of the undertaking.

The territorial concession which was required, assuming the length of the land line, from the boundary of the Colonies of South and Western Australia, on the Great Australian Bight by King George's Sound, Perth, and Champion Bay to Port Walcott on Nickol Bay, to be 2,200 miles, would be 44 stations of 40,000 acres each, or 1,760,000 acres in all, or about half a mile on each side of the line. This is the usual reserve on roads for travelling stock in the Australian Colonies.

At present the land is entirely useless, but would be opened up and rendered valuable by the introduction of the telegraph; and at the issue of the proposed 21 years' free tenancy by the Telegraph Company might thus be worth to the Government a yearly rent of 8,000 £. to 10,000 £. It will be observed that the concession was only asked where the land was unoccupied, and the practical working of the line would be impossible without its occupation by the Telegraph Company. I may add, that to railways in New County, in the United States of America, a free grant of a mile and upwards on each side of the line is frequently made.

The probable cost of a land line of telegraph from the South Australian boundary to Port Walcott on an assumed outlay of 60 £. per mile on 2,200 miles, would be 132,000 £. This is lower than the Victorian cost, which, on the data previously given, stood in 1863 at nearly 81 £. per mile; but the estimate of 60 £. is made on the authority of the gentleman, Mr. McTowan, who has been superintendent of the Victorian telegraphs since their commencement; and his assigned reasons are, the now reduced rates of wages, the unnecessarily expensive outlay in many respects on the Victorian lines, and the great number of stations required.

It would not, however, be safe to undertake such a work without a capital of 250,000 £. The probable cost of a telegraphic cable to connect the Port of Tyilatjop in Java, with Port Walcott in Western Australia, assuming the distance as 9,000 miles, and the slack at one-ninth, or 1,000 miles in all, would be for the most improved cables, about 300 £. per mile, or 300,000 £. The greatest depth of water, south of the island of Java, is 1,750 fathoms, and decreases to 200 at about 90 miles off the coast, at Port Walcott, to which it shoals very gradually from that depth. My friends and I desire to adhere to the basis of the first alternative proposal made to the Western Australian Government in my letter of 22nd November 1865 (Enclosure No. 1). But if it is so worked by Her Majesty's Government, a tender would be made for also laying an electric cable to join the telegraphic system of Java (when that system is completed from Europe) with the Australian circuit. In such a case, however, some pecuniary guarantee would be essentially necessary beyond and above the territorial concessions to be made in furtherance of my original proposal.

On receiving an intimation from the Colonial Office, or yourself, that the territorial concessions asked for, in furtherance of my original proposal are approved, and will be carried out in a contract with a company having sufficient capital, on the general basis of that proposal, my friends and I will be prepared to form and name to you the members of a company prepared efficiently to carry out the work contemplated. Meantime, I am permitted to refer you to the following gentlemen; and, awaiting your reply, which, if consonant with the interests of the public service, I crave may contain a copy of your report to Her Majesty's Principal Secretary of State for the Colonies.

S. Walcott, Esq.

I have, &c.
(signed) William Harvey.

George May, Esq.,
Director of the Chartered Mercantile Bank of India,
London and China, 32 Finsbury Circus, London.

John Inglis Harvey, Esq.,
Retired List of Her Majesty's Bengal Civil Service.
The Lodge, 13, Thistle Grove, Brompton.

P. S.—Further first-class City references can be given if desired.

Mr. W. Harvey to Colonial Secretary, Western Australia.

7, Royal Terrace, Fitzroy, Melbourne,
22 November 1865.

Sir,

I BEG through you to address your Government on a subject which, while forming part of my plans for the settlement at Camden Harbour, has, by the varied disasters attending that locality, been necessarily transferred, at all events for the time, to Nichol Bay, or such other point as Mr. Stall may select for the formation of a town site on the north-west coast. I allude to the accomplishment of telegraphic communication from Europe to Australia, by availing of the facilities now nearly continuously complete from London to the east end of the island of Java.

The sea distance from the selected starting point on the coast of Java, I propose to bridge by a smart steamer, plying (say) to Nichol Bay; thence the land line would be carried by the best route, south to the head waters of the Ashburton, to Champion Bay, and on to Perth; thence, direct to King George's Sound, and by the head of the Great Australian Bight to Adelaide.

In a few days I proceed to Adelaide for the purpose of obtaining the concurrence and support of the South Australian Government in these views, and I have now to request at the hands of the West Australian Government such territorial concessions as may be in their power, in furtherance of my enterprise which will be carried out in London, to which city I am shortly proceeding, and to which I request that your reply to this communication may be addressed, as noted below.

I should propose that the Western Australian Government should grant the free occupation for 21 years of stations of forty-thousand (40,000) acres each, when not already held under license, at distances of not more than fifty (50) miles apart, commencing at the South Australian boundary on the Great Australian Bight, and following the line to its terminus at Nichol Bay; the staff to be paid by the company to which these concessions are made, and the charges to be made on a scale to be arbitrated at the lowest possible remuneration rate, after the completion of the line; or your Government might be disposed to grant a guaranteed annual interest of eight per cent on the capital of the company; tenders for the work to be entered into at their sight.

Should neither of these propositions meet the views of your Government, you will perhaps suggest what terms would be favourably considered by them for the completion of telegraphic communication in the manner indicated.

A reply to this communication by the next British mail following its receipt, addressed as understated, will be thankfully received.

To the Colonial Secretary,
Western Australia.

I have, &c.
(signed) William Harvey,
Care of Messrs. P. Flowers & Co., Merchants,
City, London.

Sir F. Rogers to Mr. W. Harvey.

Sir,

Downing-street, 26 September 1866.

I AM directed by the Earl of Carnarvon to acquaint you that he has had under his consideration your letter of the 6th August, stating the terms upon which you are prepared to establish a telegraphic communication between this country and Australia, and further explained, by the communication which you have made personally to Mr. Walcott, of the Emigration Board. But I am desired to state that his Lordship, whilst sensible of the advantages which would naturally be derived from such a telegraphic communication, finds himself, after a careful consideration of those terms, unable to give his sanction to them.

William Harvey, Esq.

I am, &c.
(signed) F. Rogers.

Mr. Elliott to Mr. Walcott.

Sir,

Downing-street, 26 September 1866.

WITH reference to your report of the 10th instant, upon the plan of Mr. William Harvey, for establishing telegraphic communication between this country and Australia, I am directed by the Earl of Carnarvon to transmit to you, for your information, the enclosed copy of an answer which his Lordship has desired to be sent to Mr. Harvey's letter on the subject.

S. Walcott, Esq.
&c. &c.

I am, &c.
(signed) T. F. Elliott.

26 Sept. 1866.

Oriental Telegraph Company to the Secretary of State for the Colonies.

Sir,

Oriental Telegraph Company, Limited,
84, King William-street, London, 6 August 1866.

WE have the honour to enclose a sketch map, showing the lines of telegraphic communication between Great Britain and the East, for carrying out which, with the least possible delay, a company, embracing all the telegraph interests, is in course of formation, and to state, that as soon as the arrangements shall be completed, application will be made to Her Majesty's Government for such co-operation (as to surveys and otherwise) as, involving no risk of any kind, will, it is hoped, be accorded to accomplish an object of so great political as well as commercial importance.

One of the first lines laid will connect Falmouth with Gibraltar and Malta, which will render this country independent of foreign lines, except as an alternative route; and provisional contracts have been concluded with the Telegraph Construction and Maintenance Company for the manufacture and laying the whole of the sub-marine cable in successive sections, as required by the company, for an average of 300 *l.* per nautical mile, with an annual payment for their guaranteed maintenance of 10 *l.* per mile, under which contract the company are secured against all possible risks and contingencies. The arrangements embrace the entire system of telegraphic communication between this country and India, China and Australia; and it is confidently anticipated that the whole may be completed in about three years.

To the Secretary of State
for the Colonies.

I have, &c.
(signed) *Charles T. Bright.*
Charles Edwards.
Macdonald Stephenson.

Managing Committee of the Oriental Telegraph
Company (Limited).

Mr. Elliot to Charles T. Bright, Esq.

Sir,

Downing-street, 16 August 1866.

I AM directed by the Earl of Carnarvon to acknowledge the receipt of your letter of the 6th August, enclosing, on behalf of the Oriental Telegraph Company, Limited, a sketch map, showing the lines of telegraphic communication which it will be the endeavour of that company to complete.

Charles T. Bright, Esq.

I am, &c.
(signed) *T. F. Elliot.*

Mr. Seymour Clarke to Lord Cranborne.

My Lord,

London, 15 October 1866.

SOME of the leading merchants of Singapore are desirous to establish a telegraphic communication with England and Australia, by the extension of the existing telegraphic system from Rangoon southwards, through the kingdom of Siam, in the manner hereinafter described, and are promoting a company for the purpose of carrying this out, and are desirous to obtain the sanction of Her Majesty's Government, so far as it is necessary to enable them so to do.

I have to state, my Lord, that I am commissioned by the promoters of this company to ascertain from your Lordship whether you are favourable to the carrying out of such a scheme, and how they can obtain the necessary authority for them to take immediate steps to start the company, which would be under the Indian Limited Liability Act of recent date.

It is proposed to construct a line of telegraph from Rangoon, through the kingdom of Siam, to Singapore; from Malacca, through Sumatra, Java, and the Dutch islands, to the shores of Australia, with a branch from Tavoy, through Bangkok,

Bangkok, to Saigon, and thence, with the approval of France, through Cochin China, to China Proper.

The promoters of this scheme for the extension of telegraphic communication are already in possession of a concession from the King of Siam for the passing of the line through his dominions, and from the native chiefs of Quedab, Salangore, and Johore.

In the first instance, it is intended to construct only the telegraph from Rangoon, through Moulmein and Tavoy, to Bangkok and Saigon, and through the Tenasserim provinces to Singapore, as the Dutch Government have not as yet completed any arrangement for the construction of the line of telegraph across the Straits of Bancoks, through Sumatra, to Bencoolin; and thence, as before stated, by the chain of Dutch islands, to Timor or some other convenient place, for the submersion of a cable to connect it with Australia. The Dutch Government, however, view the matter with considerable favour, and steps are being actively taking for the necessary arrangements there.

The concessions from the native chiefs, above alluded to, in favour of the company, on whose behalf I address your Lordship, require the sanction of Her Majesty's Government, which sanction is also necessary for the passing of the telegraph through the English territory in that locality.

I may inform your Lordship that I learn from Singapore, under date the 1st September last, that the scheme was favourably considered by your Lordship's predecessor in office, and that the Indian Government have sent the concession home for confirmation; but this information may not be correct. I am desirous, therefore, to ask your Lordship what steps it is necessary for the promoters of the telegraph company about to be launched to take, in order to obtain your Lordship's approval of the concessions already granted by the native chiefs, and for the passing of the line of telegraph through the territory under your Lordship's control.

I have, &c.

(signed) *Seymour Clarke.*

The Right Hon. Lord Cranborne, M.P.,
Secretary of State for India.

Mr. J. C. Melvill to Mr. Seymour Clarke.

Sir,

India Office, 25 October 1866.

I AM directed by Lord Cranborne to acknowledge the receipt of your letter of the 15th instant; and I am to inform you, in reply, that whilst the principal matters adverted to in your communication are for the consideration of Her Majesty's Secretaries of State for Colonial and Foreign Affairs, he has every disposition to encourage the project to which you invite his attention, namely, a scheme for the establishment of telegraphic communication between India and Australia, by way of Rangoon, Siam, and Singapore; and that, so far as concerns the line passing through any part of Her Majesty's Indian possessions, every facility will be given to the proposed company for the prosecution of an experiment which, if successfully accomplished, will be advantageous to the national interests. I am to observe, however, that as the superintendence of the Straits Settlements is now in course of transfer to the Colonial Office, the power of the Indian Government to promote the object in view will extend only so far as concerns the passage of the telegraphic wires through Pegu and the Tenasserim provinces.

I have, &c.

Seymour Clarke, Esq.,
&c. &c.

(signed) *J. Cosmo Melvill.*

Mr. Gisborne to the Earl of Carnarvon.

My Lord,

7, Bruton-street, W., 27 November 1866.

I BEG to enclose a map, showing the existing systems of telegraph between this country and India, with the proposed extensions to Singapore, China, and Australia; also a set of resolutions, dated the 13th instant, addressed to your

Lordship, and signed by most of the members of the deputation who had the honour of waiting upon you on the 6th instant, and by others who are interested in the establishment of the proposed telegraphic communication; also a document, dated the 14th instant, which states the class of cable proposed to be adopted, the capital which will be required, and explains by way of illustration one of the several possible plans by which Her Majesty's Government might substantially facilitate the raising of the above capital by a company.

It is desired, in the first instance, to ascertain whether Her Majesty's Government will take a part in the establishment of the proposed lines; and your Lordship will observe that no special plan of financial assistance is put forward by the resolutions, it being considered best to leave that question open for discussion with the Treasury.

The deputation, indeed, proposed three such plans: first, that by which Her Majesty's Government would guarantee a minimum rate of interest upon the cost of the lines; secondly, that which was adopted by the Australian and Dutch Governments, of an annual subsidy, amounting to five per cent. upon the cost of the lines for a term of years, such subsidy to be worked off by Government by the free transmission of State messages; and, thirdly, that by which Government would contribute a portion, say, one-third, of the required capital, either by subscribing for shares representing that amount, or by way of loan, at a fixed rate of interest, to be repaid by annual payments, in the manner that might be agreed upon. Your Lordship was pleased to express yourself sensible of the advantages, commercially and generally, of such a telegraphic communication with Australia; but you added that you felt bound to point out at once, independently of minor difficulties, the objections which were felt by Parliament, and, in your opinion, not unreasonably felt, to an Imperial guarantee for objects which were not of strict Imperial importance. Your Lordship, however, also stated that you would be willing to give your best consideration to any information the deputation might give you on the subject, or to any written communication which they might place before you.

The deputation stated their opinion that the defence of the Colonies would be greatly facilitated by the proposed communication, and that consumers of Colonial produce in this country would greatly benefit by the facilities which it would afford to trade. I may, moreover, observe, that by granting financial assistance to the undertaking in question Her Majesty's Government will adopt the only course by which it can effectually obtain a control over a means of communication which, as between distant countries, will undoubtedly supersede the postal service, and by which it will secure the early realisation of the projected lines.

Whatever may be the nature of the financial assistance, if any, which may be extended by Her Majesty's Government to this undertaking, I am desirous of showing that strong reasons exist for believing that any application to the Indian, Dutch, and Australian Governments, if not also to the French Government, by Her Majesty's Government, to relieve it of a substantial portion of such assistance will be attended with success.

Your Lordship will find, by referring to the Blue Books quoted in the margin, that since 1858,* when the project of a telegraph to Australia was first broached, up to the present time, the Government of India has uniformly stated that it would grant financial assistance towards establishing the Rangoon and Singapore telegraph, but only upon the condition that the lines beyond Singapore to China and to Australia, should be practically secured; and that the late Secretary of State for India, Sir Charles Wood, specially required that the Treasury† should assist those lines, probably considering that the co-operation of Her Majesty's Government was required to ensure success. The feeling evidently

was

* *Vide* letter, dated 14th July 1858, printed in the Third Report of the Committee on Packet and Telegraphic Contracts, 5th July 1860 (431), p. 74.

† *Vide* letters, dated 29th May and 29th of August 1862, printed in the Correspondence relating to telegraphic communication between India, Singapore, and Australia, 4th February 1864, pp. 56 and 68; also a letter, dated 10th February 1864, printed in the Return, dated 23rd May 1864 (380), p. 25; also a letter, dated 25th April 1864, printed in the Return, dated 29th March 1865 (199), p. 11; also Report of Committee on East India Communications, 20th July 1866 (428), p. 636.

was that the revenues of India should not be charged with assisting the Rangoon and Singapore line as a local line, but only as part of a system to the countries beyond Singapore. It was probably considered that, as part of such a system, it would be remunerative, but not otherwise.

The Blue Books quoted in the margin also show that the Australian Colonies, with the single exception of South Australia, promised, in 1860, to grant to a company a subsidy of 35,000*l*.* per annum for 21 years, applicable to the line between East Java and Australia, with liberty to the subsidising Governments to work off such subsidy by the free transmission of State messages; and that the Dutch Government granted, in 1862, a subsidy of 8,500*l*.† per annum for 30 years upon similar conditions applicable to the Singapore and Batavia line. These subsidies amounted to five per cent. upon the estimated cost of the respective lines; they lapsed however in consequence of the repeated refusals of Her Majesty's late Government to assist the Rangoon and Singapore section, which is the first link in the chain.

Your Lordship will remember the opinion stated by the deputation, and repeated in the third resolution that the Australian Colonies will share equally with Her Majesty's Government any financial assistance which it may grant towards the Java and Australian section.

The establishment of telegraphic communication with India, and with America, has demonstrated the inestimable advantages of instantaneous communication with distant countries. It will be evident to your Lordship that China and Australia will be under a serious disadvantage, as compared to India, if they have not the same means of communicating with Europe as that country. The Committee on East India Communications, which sat last Session, reported that the political and commercial importance to India, China, and Australia, of possessing efficient telegraphic service, is greater in degree than the necessity for an efficient postal service; ‡ and recommended that China and Australia should be brought within the reach of telegraphic communication with Europe.§

I may state that the proposed lines will accommodate an annual trade, local and international, of 153,800,000*l*. employing 31,095 square-rigged vessels, of an aggregate tonnage of 10,657,151 tons. Of this trade, Singapore and the Straits Settlements represent 20,500,000*l*., China, 86,600,000*l*., Java, 8,200,000*l*., and Australia, 38,600,000*l*.||

I also desire to direct your Lordship's attention to the fourth resolution, by which Her Majesty's Government is asked to cause detailed soundings to be taken between East Java, Celebes, Timor, and Port Essington, on the northern coast of Australia. The portion of the sea, between Celebes and Timor, a distance of some 450 miles, is totally unsounded, and the remainder is only partially sounded. With the above exception, however, the whole of the seas proposed to be traversed by the cables to be laid from Rangoon to Singapore, China, Java, and Australia are already sufficiently well sounded for preliminary purposes, and the cables can everywhere be laid in a depth of 20 to 60 fathoms.

A war steamer is now stationed at Cape York, and I am informed that the required soundings could be taken by it at an expense of some 1,500*l*.

In conclusion, I wish to state as the opinion of those who have thought most upon the subject, that a work which has to be executed at such a distance from England is not likely to be carried out exclusively by private enterprise, and considering how many Governments have a deep interest in it that it is highly advisable that they should take a part in its establishment.

I have, &c.
(signed) *F. Gisborne.*

* *Vide* Return, dated 4th February 1864 (22), pp. 18, 30, 43, and 72; also Return, dated 23rd May 1864 (380), pp. 18, 20, and 23.

† *Vide* Return, dated 4th February 1864 (22), pp. 69 and 70.

‡ Paragraph 31.

§ Sixth recommendation, p. 14.

|| *Vide* Report of Committee on East India Communications (1866), pp. 632. 635.

(Enclosure.)

India, China, and Australia Telegraph.

London, 13 November 1866.

THE undersigned have agreed to the following resolutions, namely:

1st. That application be made to Her Majesty's Government to grant such financial assistance to a company as will facilitate its raising a capital of 2,600,000 £. for the purpose of carrying out telegraphic extensions from India (Rangoon) to Singapore, and thence in one direction to Shanghai, and in the other to Java and Queensland.

2nd. That Her Majesty's Government be requested to apply to the Indian Government to relieve it of some portion of the financial assistance which Her Majesty's Government may grant towards the Rangoon and Singapore section; to the French Government, to relieve Her Majesty's Government in like manner with respect to the Singapore and Saigon section; to the Dutch Government, to relieve it with respect to the Singapore and Batavia section; and to the Australian Government, to relieve it with respect to the Java and Australian section.

3rd. That those of the undersigned, who are connected with the Australian Colonies, are of opinion that they will share, equally with Her Majesty's Government, any financial assistance which it may grant towards the Java and Australia section.

4th. That Her Majesty's Government be requested to cause detailed soundings to be immediately taken between East Java, Celebes, Timor, and Port Essington, on the northern coast of Australia.

5th. That Mr. Francis Gisborne be requested to carry on the necessary negotiations with Her Majesty's Government, in order to give effect to the above resolutions.

The Right Hon. the Earl of Carnarvon,
Secretary of State for the Colonies,
&c. &c. &c.

(74 Signatures.)

Mr. Elliot to Mr. Gisborne.

Sir,

Downing-street, 31 December 1866.

I AM directed by the Earl of Carnarvon to acknowledge the receipt of your letter of the 27th ultimo, enclosing a map, showing certain proposed extensions of telegraphic communication to Singapore, China and Australia, and a copy of resolutions adopted by numerous gentlemen who are willing to form a company for the purpose.

I am desired to acquaint you, that the Lords Commissioners of the Treasury have recently stated to Lord Carnarvon that they would view with satisfaction the extension of telegraphic communication to the Straits Settlements, and to the Australian colonies; but that they do not feel that they would be warranted in calling upon Parliament to assist in carrying such a scheme into effect, either by a grant of public money, or by guaranteeing interest on money raised by a company for the purpose. Her Majesty's Government would have every disposition to grant all reasonable facilities for running telegraphic wires through the territories of Her Majesty, though it may be desirable to mention that priority for Government messages would be a necessary condition.

Lord Carnarvon has forwarded copies of your communication to the Treasury and the Admiralty.

I am, &c.

(signed) T. F. Elliot.

F. Gisborne, Esq.

Mr. Gisborne to the Earl of Carnarvon.

My Lord,

7 Bruton-street, W., 21 January 1867.

I HAVE the honour to acknowledge the receipt of your Lordship's letter of the 31st ultimo. Your Lordship states in that letter, that the Lords Commissioners of the Treasury are desirous of seeing the proposed telegraphic communication carried out, and also of facilitating its establishment; but not by any grant of public money or by guaranteeing interest on money to be raised by a company for that purpose; in fact, only to the extent of granting facilities for running land wires, I presume by a company, through the territories of Her Majesty.

At

At present the plan of the promoters, for reasons which it is needless to discuss in this communication, does not include any such land wires, although, should Her Majesty's Government extend the Indian telegraph system from its present terminus at Moulmain to the British frontier towards Singapore, at the 10th degree of latitude, the promoters would adopt that line, and start their sea line from that point; this would so far facilitate the operations of the promoters, that the capital required for the proposed extensions from that point, instead of from Rangoon to Singapore, China and Australia, would be somewhat diminished.

A large amount of capital will, however, in any case be required, and I am desired to state, for the information of Her Majesty's Government, and with a view to a full and accurate consideration of this large and important question by Her Majesty's Ministers, that it will materially facilitate the raising of the required capital, should Her Majesty's Government provide ships to carry and lay the cable, as was done by the British and American Governments for the Atlantic Cable in 1867 and in 1858, and would guarantee a fixed amount of traffic from State messages for a term of years upon the proposed lines, or such of them, as it may desire to see carried out at once.

Her Majesty's Government would be relieved of a substantial portion of any assistance which it may grant, whether in ships, or by a contribution to capital, by annual subsidy, or guarantee of interest or business, by the Indian, French, Dutch, and Australian Governments taking part in the plan of assistance, which may be determined upon, as pointed out in the letter and enclosures which I addressed to your Lordship on the 27th of November last.

Should Her Majesty's Government substantially facilitate the raising of the required capital by any of the above methods, the Company would concede priority of transmission in favour of State messages, and would give Her Majesty's Government the power of regulating the tariff of all messages in conjunction with the company.

I am loth to conclude this letter without again pressing upon your Lordship's consideration the great importance to public interests, that telegraphic communication to the East should not be carried out without Government taking a part in its establishment, and thereby reserving to itself a control over its working. In a matter of such national interest and importance, Government aid should surely be granted, and private enterprise not be left to bear the whole burden of the work.

I have, &c.
(signed) *F. Gisborne.*

The Right Hon. the Earl of Carnarvon,
&c. &c. &c.

Mr. *E. Hammond* to the Under Secretary of State for the Colonies.

Sir, Foreign Office, 3 January 1867.

WITH reference to your letter of the 31st ultimo, I am directed by Lord Stanley to enclose, for the information of the Earl of Carnarvon, a correspondence, as marked in the margin, relative to the proposed line of telegraph between Singapore, Siam, and Australia.

These papers being sent in original, I am to request that they may be returned to this office when done with.

I am, &c.
(signed) *E. Hammond.*

The Under Secretary of State,
Colonial Office.

Mr. Knox, No. 22, 24 April 1866.
To India Office, 8 June 1866.
From India Office, 14 June 1866.
To Mr. Knox, No. 35, 19 June 1866.
From Mr. Clarke, 20 July 1866.
To Mr. Clarke, 30 July 1866.
From Mr. Clarke, 29 October 1866.
To Mr. Clarke, 1 November 1866.
From Mr. Clarke, 14 November 1866.
To Mr. Clarke, 20 November 1866.
From India Office, 13 December 1866.
To India Office, 19 December 1866.
From India Office, 22 December 1866.
To Mr. Knox, No. 27, 26 December 1866.

(Enclosures.)

Foreign Office, 8 June 1866.

Sir,
I AM directed by the Earl of Clarendon to transmit to you the accompanying copies of a Despatch from Consul Knox, and its Enclosures, respecting a proposal which has been made to the Government of Siam by Messrs Read & Paterson, for the construction of a telegraphic line from Rangoon to Singapore and Bangkok; and I am to request that, in

laying the same before Lord De Grey and Ripon, you will move his Lordship to cause Lord Clarendon to be favoured with any observations which he may have to make thereupon.

The Under Secretary of State,
India Office.

I am, &c.
(signed) *E. Hammond.*

My Lord,

British Consulate, Bangkok, 24 April 1866.

I HAVE the honour to report that Mr. W. H. Read, one of the promoters of a company to be formed for the purpose of constructing a telegraphic line between Singapore and Rangoon, and which is also to connect Bangkok with those places, has lately visited Siam, in order to obtain the permission of the Siamese Government, through whose territories a great part of the line must of necessity run.

I have the honour to enclose a copy of the arrangements made, in English, which Mr. W. H. Read has entered into with the Siamese Government, together with that gentleman's letter to me on the subject. From the above documents, it will be seen that Mr. Read has still to complete his arrangements with the Governors of the Tributary Provinces before the matter can be ultimately settled.

Before coming on here it appears that Mr. Read, together with Mr. W. Paterson, the other promoter of this Company, had obtained from the Tumongong of Johore, through whose territory the line must pass, an exclusive right to erect it. No such privilege will be granted by the Siamese Government, though the proposed agreements are not quite so clear on this head as they might be.

I am unable to form an opinion as to whether or no the promoters are likely to succeed in getting up a Company; but I think I may safely state that if such a Company is formed, neither the construction of the line in this country, nor the working of it, when finished, is likely to lead to any difficulties with this Government.

It will probably take Mr. Read at least four months to conclude his arrangements with the Tributary States. When that has been done, the Siamese Government will confirm the agreements thus entered into; and having drawn up one specially referring to the Provinces of Siam proper, will also request me to witness the whole.

I beg to solicit instructions from your Lordship as to whether there is any objection to my doing so.

The Earl of Clarendon.

I have, &c.
(signed) *T. G. Knox.*

Sir,

Bangkok, 23 April 1866.

I HAVE the honour to forward you herewith a circular letter, in Siamese, Malay, and English, from his Excellency the Prime Minister, to the Governors of various provinces under the rule of Siam, granting me the Royal permission of his Majesty the King of Siam to construct an electric telegraph line through his dominions. I shall feel obliged if you will be so good as to certify to the genuineness of the seal appended thereto. I also forward a copy of the agreement drawn up between the Siamese authorities and the promoters of the scheme; and I trust that you will bring the same to the knowledge of Her Majesty's Government, and grant it the favourable weight of your opinion.

T. G. Knox, Esq.,
&c. &c. &c.

I have, &c.
(signed) *W. H. Read.*

THE Order of Chow Phya, Aka Maha Sena Tibodi Apaiah Piri Bara Kroma Pahu Samuha Phra Kalahome, the Prime Minister of the kingdom of Siam, to the Governors of the Provinces of Syluri, Plit, Satong, Tarang, Pangha, Taknopa, Kanong, and Kaluri.

Mr. William Henry Read, merchant, of Singapore, having visited Bangkok, solicited the privilege of constructing a telegraph from Rangoon to Tavoy and Mergui, and from thence, across the River Kra, into Siamese territory; to wit, through the districts of Kanong, Tahupa, and Pangha, which are under the jurisdiction of the province of Nakon Sri Thamarath Pakaty; likewise the provinces of Nang Satong, Plit, and Syluri, tributary States of Siam, and from thence, through Perak, Salangore, and Malacca, to Singapore. The several particulars of Mr. William Henry Read's request are known to his Majesty the King, who has graciously announced his approval, saying, "Telegraphic lines are in great esteem among European nations, as convenient and quick ways of communicating messages." Other nations having consented to the complete construction of the proposed telegraph, therefore His Majesty has also been pleased graciously to grant his Royal sanction to the construction of this telegraphic line through the above-mentioned portions of the Siamese territory.

The agreement and supplementary articles to the same have already been forwarded to the respective Governors, for their inspection.

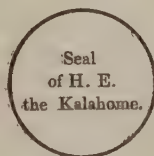
Should Mr. William Henry Read, or any other person empowered by him, come to the above-mentioned

above-mentioned provinces, to examine and mark out the course of the proposed telegraphic line, the Governors must receive Mr. William Henry Read, or his agent, and make, with one or the other on behalf of the Company, an agreement substantially like the one already transmitted to them.

Should it become necessary to modify the agreement for an obvious improvement, or for a clearer understanding of the conditions thereof, the Governor of the province and Mr. William Henry Read, or his agent, must mutually consult and agree to such alterations.

A perfect understanding between the Governors of the various provinces and Mr. William Henry Read, or his agent, having been arranged, the agreement and the supplementary articles, bearing their seals of office, shall be sent to Bangkok for confirmation, and to receive the seals of the Minister of State and of Her Britannic Majesty's consul, after which they will be sent back to the provinces, and thenceforth to be considered in full force.

Given at Bangkok, on Monday, the 2nd day of the waning moon, the sixth month, Siamese Civil Era 1228, year of Tiger, the eighth of the Decade, and the 16th of the reign of our Sovereign, corresponding with the 16th day of April A. D. 1866.



Sir,

India Office, 14 June 1866.

I AM directed by Lord De Grey to acknowledge receipt of your letter of the 8th instant, with its Enclosures, from Her Majesty's Consul, at Bangkok, relative to the proposed construction of a line of telegraph from Rangoon to Singapore and Bangkok, with respect to which he has no observation to offer, further than that it would be gratifying to him to learn that the project has been successfully accomplished.

Right Hon. E. Hammond.

I am, &c.
(signed) J. Stansfeld.

Sir,

Foreign Office, 19 June 1866.

I FORWARDED to Her Majesty's Principal Secretary of State for India copies of your Despatch, No. 22, of the 24th April, and its Enclosures, respecting the proposed construction of a telegraphic line from Rangoon to Singapore and Bangkok; and I now transmit to you, for your information, a copy of a letter which I have received from the India Department, in reply.

India Office, 14 June 1866.

The Great Northern Railway, General Manager's Office,
King's Cross Station, London, N., 28 July 1866.

My dear Sir,

WILL you kindly tell me which department of Her Majesty's Government would deal with the subject of a line of telegraph, through Singapore, Siam, and Dutch Islands, and thence to Sydney, Melbourne; a route is proposed to Saigon.

I have a letter by this mail from my brother-in-law, who is one of the leading merchants at Singapore, and who is also Dutch consul, and Chairman of the Chamber of Commerce, saying he has a concession from the King of Siam for the telegraph through his territory, and that it is looked upon favourably by the Dutch people, and he thinks also by the French for Cochin China,

He asks me to ascertain whether our Government would desire to have anything to do with it.

My object in troubling you now with this letter is to ask whether this is a subject for the Foreign Office, or for the Indian or Colonial Departments.

If you could kindly give me your ideas as to the way to deal with this matter, I should feel much obliged, and I venture to think that for old acquaintance sake, you will not consider that I am taking a liberty in thus writing to you.

E. C. Egerton, Esq., M.P., Foreign Office,
Whitehall.

I am, &c.
(signed) Seymour Clarke.

My dear Sir,

Foreign Office, 30 July 1866.

I AM desired by Mr. Egerton to acknowledge the receipt of your letter of the 28th instant, and I am to state to you, in reply, that the project of a line of telegraph between Singapore, Bangkok, and Rangoon has been announced to the Foreign Office by our Consul in Siam. His despatch was referred to the India Department, and Lord De Grey's

reply went no further than to say that it would be gratifying to him to learn that the project has been satisfactorily accomplished.

The Treasury would be the best office to apply to for information, whether the Government were disposed to assist, but I should doubt their doing so.

Mr. Seymour Clarke.

I am, &c.
(signed) *H. C. L.*

The Great Northern Railway, General Manager's Office,
King's Cross Station, London, N., 29 October 1866.

My Lord,

You have taken so kind an interest in the matter of telegraphic extension from Rangoon, through Siam, to Singapore, that I venture once more to trouble your Lordship.

* See pages 16 & 17.

On receipt of your last note I addressed a letter* to Lord Cranborne embodying what I had written to your Lordship, but omitting any application for funds towards carrying out the project, and I have been favoured with a reply,* of which I enclose a copy.

You will, my Lord, find in it that the India Office consider it is a matter to be dealt with by the Foreign and Colonial Offices, and that the power of the Indian Government to promote the object in view, will be limited to the passage of the telegraphic wires through Pegu and the Tenasserim Provinces.

I will now address the Colonial Office; but am most desirous to know, after what has passed with your Lordship, how I am to get for the promoters of this telegraph such sanction from your Department as is necessary in order to start the thing.

Your Lordship will, I know, pardon me for reminding you that you said the matter must be dealt with by the India Office, as it had nothing to do with the Foreign Office, except eventually in any arrangements with the Dutch Government.

The Right Honourable Lord Stanley, M.P.,
Foreign Office.

I have, &c.
(signed) *Seymour Clarke.*

Sir,

Foreign Office, 1 November 1866.

I AM directed by Lord Stanley to acknowledge the receipt of your letter of the 29th ult. on the subject of the projected line of telegraph from Rangoon to Singapore, and I am to state to you, in reply, that Lord Stanley will be happy to give such assistance to the enterprise in question as he can properly extend to it, and thus he will be ready to take steps with that view as soon as he is apprised of the nature of the assistance required, and is furnished with details which will enable him to explain the matter to any Foreign Government to which it may be desired that application should be made.

Mr. Seymour Clarke.

The Great Northern Railway,
General Manager's Office, King's Cross Station,
London, 14 November 1866.

My Lord,

SINCE I last troubled your Lordship with reference to the line of telegraph between Rangoon and Moulmein to Singapore and Saigon, I have been in communication with the Colonial Office, and have had the honour to receive from Lord Carnarvon a suggestion that the approval of the Treasury and of the Board of Trade would be wanted, in addition to those of the Department over which your Lordship presides.

By the last mail from Singapore I received the enclosed prospectus of the "Eastern Asia Telegraph Company." I have annexed thereto a map, showing the line that the telegraph would take.

Time is a great object in this matter, and I now venture to ask for the approval of the Foreign Office of the following points: first, the passage of the line of telegraph through the British dominions, through which it is proposed to carry it; and, secondly, the approval of Her Majesty's Government of the concessions granted to the promoters of this line of telegraph by the King of Siam and other native chieftains.

The Right Hon. Lord Stanley, M.P.,
Secretary of State for Foreign Affairs.

I have, &c.
(signed) *Seymour Clarke.*

Sir,

Foreign Office, 20 November 1866.

I AM directed by Lord Stanley to acknowledge the receipt of your letter of the 14th instant relative to the projected line of telegraph between Rangoon and Moulmein to Singapore and Saigon; and I am to state to you, in reply, that it is not for the Foreign Office, but for the India and Colonial Offices, to signify approval as to the passage of such a line of telegraph through the British dominions, and that if the India Office concur in the concession made to the Company by the King of Siam, the Foreign Office see no reason to dissent from it.

Sir,

India Office, 13 December 1866.

I AM directed by Lord Cranborne to forward, for the information of Lord Stanley, the accompanying copies of correspondence received from the Government of India, on the subject of a proposed line of telegraph between Rangoon, Singapore, and Australia; and in transmitting these papers, I am to request that you will move his Lordship to favour Lord Cranborne with his opinion on the subject, especially with reference to the cession granted by the King of Siam to the projectors.

The Under Secretary of State
for Foreign Affairs.

I am, &c.
(signed) *Herman Merivale.*

(Home Department.—Electric Telegraph.—No. 33 of 1866.)

To the Right Honourable Viscount *Cranborne*, Secretary of State for India.

My Lord,

Simla, 9 August 1866.

WE have the honour to transmit for your information a copy of the correspondence noted in the margin on the subject of a proposal made by certain influential mercantile gentlemen at Singapore for the formation of a Company for the establishment of telegraphic communication between Moulmein and the several stations in the Straits Settlements.

From Straits, No. 9-336, dated 23 March 1866, and Enclosure.
From Straits, No. 13, dated 12 May 1866, and Enclosures.
From Straits, No. 16-593, dated 21 May 1866, and Enclosure.
To Straits, No. 3359, dated 3 August 1866.
To Officiating Director General of Telegraphs, No. 3360, dated 3 August 1866.

2. We beg to recommend the ratification by Her Majesty's Government of the terms offered by the King of Siam to the proposed Telegraph Company.

We have, &c.
(signed) *John Lawrence.*
W. N. Mansfield.
H. S. Maine.
W. Grey.
G. N. Taylor.
W. N. Massey.
H. M. Durand.

From Lieutenant *M. Protheroe*, Officiating Secretary to the Government of the Straits Settlements, to *E. C. Bayley*, Esq., Secretary to the Government of India, Simla, (No. 9-336, dated Singapore, 23rd March 1866).

I HAVE the honour, by desire of his Honor the Governor, to forward herewith, for submission to his Excellency the Governor General in Council, copy of a communication (No. 1), dated the 22nd instant, from the senior resident partners of three of the most influential mercantile firms at Singapore, on the subject of the establishment of telegraphic communication between Moulmein and the several stations in the Straits.

2. With reference solely to the intimate commercial relations between Singapore and Calcutta and the rice ports in British Burmah, as well as to the present telegraphic connection between India and Europe, his Honor entertains little doubt that the proposed telegraph line would prove remunerative to its promoters, and highly beneficial to the public; whilst, even in a political point of view, it would prove of considerable advantage. Hence, in the event of there being no intention on the part of the State to extend the existing Burmah line to Singapore, he would most earnestly beg to recommend the contemplated scheme to the favourable consideration of his Excellency in Council.

3. Pending the receipt of instructions from the Supreme Government, his Honor has not deemed it expedient to enter into any discussion with the applicants as to the terms under which Government support might be afforded to their project, but he presumes that these terms would embrace the following provisos:—

1st. A guarantee of the monopoly, as far as British territory may be concerned, for a prescribed number of years only.

2nd. A limited rate of charge.

3rd. Completion of the line within a specified time.

4th. The power of Government to cancel the agreement, in the event of the telegraphic service not being conducted to its satisfaction.

4. As already stated in previous correspondence, his Honor would anticipate little difficulty in obtaining from the native chiefs the necessary sanction for the line to be carried through their respective States.

From Messrs. *W. Paterson, W. H. Read, and J. J. Greenshields*, to Lieutenant *M. Protheroe*, Deputy Secretary to the Government of the Straits Settlement; dated Singapore, 22nd March 1866.

WE have the honour to request that you will bring to the notice of the Honourable the Governor, that preliminary arrangements have been made by us for the formation of a Company, with adequate capital, for the purpose of opening up telegraphic communication between Moulmein and this place, with extensions to Java and Australia, and in other directions, provided this project meets with the sanction and support of the Government of India. Already negotiations have been entered into with the rulers of the Native States through which the line will have to pass. His Honor the Tumongong of Johore has already given his consent, and his Majesty the King of Siam has expressed himself favourable to the scheme; but it would materially facilitate the progress of these transactions, should the Honourable the Governor, approving of the scheme, afford us his support, and communicate with the Governments or Chiefs of the said countries, in order to remove any erroneous impressions they may entertain as to the feelings of the British authorities on the subject.

The manifest advantages of such a line need not be dwelt upon; and the benefits it would confer, both political and commercial, are apparent at a glance. We venture, therefore, confidently to hope that the Honourable the Governor will be pleased to take this important subject into his earnest consideration, and grant us the assistance we seek as soon as may be convenient.

No. —, dated Simla, — April 1866.

FORWARDED to the Officiating Director General of Telegraphs in India for report, and its return requested.

By order,

(signed) *A. M. Monteath*,
Under Secretary to the Government of India.

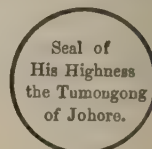
From Lieutenant Colonel *R. Macpherson*, Secretary to Government, Straits Settlement, to *E. C. Bayley, Esq.*, Secretary to the Government of India, Simla, (No. 13, dated Singapore, 12 May 1866.)

IN continuation of my Despatch No. 9, dated 23rd March 1866, I have the honour, by desire of his Honor the Governor, to forward herewith, for the consideration of his Excellency the Governor General in Council, copies of letters dated respectively 7th and 10th instant, from the Regent of Johore and from Mr. Read, submitting statements of the concessions obtained by the proposed Telegraph Company from their Highnesses the King of Siam and Tumongong of Johore. It will be observed that, in both cases, the concession will require the confirmation of the British Government. A transcript of the order issued by the Foreign Minister at Bangkok to the several Siamese Governors is annexed.

From *Wankoo Abdulrahman*, Regent of Johore, to the Secretary to the Government of the Straits Settlements.

AFTER Compliments,—We beg to enclose herewith the copy of a concession granted by his Highness Datu Tumongong Abubakar Sri Maharajah, Rajah of Johore, to Messrs. *W. Paterson and W. H. Read*, on the 21st March last, of the exclusive right of carrying a line or lines of Telegraph through the territories of Johore. We shall thank our friend to lay this before his Honor the Governor for his information. Our friend will observe that, to make this concession effectual, it requires the recognition and approval of the British Government, and we shall be glad to hear that it meets with such recognition and approval.

Dated at Telloh Blangah, this 7th May 1866.



CONCESSION.

HIS HIGHNESS Datu Tumongong Abubakar Sri Maharajah, Rajah of Johore, to all the world Greeting.—Beit known that we, for divers good considerations and reasons thereunto us moving, do hereby for ourselves, our heirs, and successors, grant and concede unto William Paterson and William Henry Read, both of Singapore, merchants, the promoters of a Company for establishing a line or lines of Electric Telegraph between Rangoon and Singapore, and to their heirs and assigns for the term of 99 years from the date hereof, the sole and exclusive right and privilege of carrying a line or lines of Electric Telegraph through our territories, the course of the said line or lines of Telegraph to be such as the concessionaires may select and approve.

Art. 2. And we hereby grant to the concessionaires full power and authority to erect stations and other buildings and to set and put up posts or pillars along the line of the said Telegraph and to take the ground necessary for such purposes, and to make and receive such rates and charges as they may think proper for the transmission of messages along the said line or lines of Telegraph, and to make such rules and regulations as they may think proper for the due working and management of the said Telegraph, subject to our approval; and all persons connected with the said Telegraph are to have power to reside at any place along the said line or lines within our territories without further authority from us for that purpose, but all such persons shall be subject to the laws and courts of Johore, and shall be liable to pay the customary Government taxes and municipal rates that may be levied in those parts of our territories.

Art. 3. And we also give and grant to the said concessionaires full power to cut down and use, for the purposes of the said Telegraph, the timber which they find along the course of such line or lines of Telegraph.

Art. 4. And for the purpose of enabling the concessionaires to have full use and enjoyment of the property and the rights and privileges which we hereby grant to them, we hereby promise that they shall have full right to assert and protect the same in our courts of law, and that the concessionaires shall have all the rights of British subjects under any treaties now subsisting, or that may hereafter be made between us and Great Britain, and the machines, apparatus and buildings shall be their property, and that our Government will protect them in the use thereof.

Be it known, however, that the foregoing privileges and concession are granted by us on the following conditions only:

Art. 5. That this concession shall be recognised and approved of by the British Government.

Art. 6. That the concessionaires shall forthwith proceed to make and complete the said line or lines of Telegraph, and that in the event of the said line or lines of Telegraph not being completed and in operation within the period of three years from the date of their procuring the recognition and approval of the British Government, it shall be in our power to declare this concession cancelled and null and void.

Art. 7. That whenever and so often as in any year the clear profits arising from the use of the said line or lines of Telegraph between Rangoon and Singapore or in connection therewith, shall amount to 10 per centum or upwards on the capital invested in the same, there shall be paid to us such a proportion of one-tenth of the said clear profits as the length in miles in which the said line or lines is or are carried through our territories shall bear to the whole length of the said line or lines of Telegraph between Rangoon and Singapore, or in connection therewith.

Art. 8. The foregoing concession is not in anywise to affect our sovereign rule and power over any part of our territories, and is to be considered as withdrawn in the event of any of the above-mentioned stipulations not being faithfully performed by the concessionaires; and it is clearly understood that any disputes as to the concession or the working of the said line or lines of Telegraph is to be decided between us and the British Government.

Given under our hand at Johore Bahru (near Johore), this 21st day of March, in the year of the Christian Era, 1866, corresponding to the 5th day of the month, Dulkaida, in the year 1282 of the Mahomedan Era.

(signed) *Abubakar,*
Rajah of Johore.

L. S.

We the undersigned agree to comply with the above-mentioned stipulations and regulations.

(signed) *W. Paterson.*
W. H. Read.

From *W. H. Read, Esq.*, to Lieutenant *M. Protheroe*, Deputy Secretary to Government, Straits Settlement, dated Singapore, 10th May 1866.

I HAVE the honour to forward herewith, for the information of his Honor the Governor, three copies of the Agreement entered into with the Siamese Government for the promotion of the proposed Telegraph Company between Rangoon, Singapore, &c. &c.

AGREEMENT.

PHYA,

Whom His Majesty the King of Siam has been pleased to nominate Governor, having jurisdiction over the Province of the boundaries of which are from

to

hereby agrees and covenants with William Henry Read and William Paterson, Esqrs., of Singapore, merchants, as follows:

1. We, and all those whom his Majesty the King of Siam shall please to appoint hereafter as our successors, shall strictly abide by the conditions of this Agreement:

Whereas the said William Henry Read and William Paterson, as promoters of a Company, are desirous of constructing an electric telegraph from Rangoon to Singapore and from these places to Bangkok; it is hereby agreed that this undertaking shall remain absolutely in the hands of the said Company, or of those who may represent it at any future period, the said Company agreeing to construct and work, at its own expense, all the lines of telegraph carried through the province under our control, we, the Governor of the said province of

conceding and granting to the said Company the said privileges for a period of ninety-nine years, which concession, having been sealed with our seal, shall be forwarded to Bangkok for the final confirmation of the Ministers of State, and of Her British Majesty's Consul, who will affix their respective seals thereunto, and from the date of such ratification the Telegraphic Company shall enter upon the rights conceded.

We hereby concede and grant to the said Company sufficient ground for the building of dwelling houses, stations and offices necessary for the purpose of carrying out their undertaking, and for the erecting of posts of wood or stone to support the telegraphic wires throughout.

The tariff of charges for messages through the telegraph shall be mutually agreed, and the Company shall have power to frame such regulations as may be deemed necessary for the management of the said telegraph; such regulations must, however, be submitted to us for our approval and sanction.

Persons working for or connected with the said telegraph shall have full liberty to enter and pass through our country, without a passport, but the Company and their servants must be amenable to the regulations, duties and customs of the country under our control.

3. We hereby concede and grant to the said Company the right to cut down trees, which have no legitimate owners, for the purposes of the telegraph where necessary: but trees in plantations, the property of persons having a right thereto, must be paid for by the Company.

4. We hereby concede and grant unto the said Company all advantages and benefits of whatever kind or nature which may accrue to the telegraph under this agreement; and should any local dispute occur, the case may be tried at our Court, according to the stipulations of the Treaty between England and Siam, or of any Treaty which may hereafter be entered into.

Every protection shall be afforded of the property of the said Company, on condition that this Agreement is carried out in all its integrity.

5. The said Company must commence and finish the line of telegraph within the period of three years, or otherwise this Agreement shall be considered null and void. The said term of three years shall commence from the time Her British Majesty's Government shall have ratified this Agreement.

6. If there is any profit from this line of telegraph, which is to be constructed from Rangoon to Singapore, with the other branches, exceeding 10 per cent., the said Company is to give up one-tenth of the said clear profits, which amount shall be divided in proportions according to the extent of miles in length in each country from Rangoon to Singapore, or of the branches in connection therewith.

7. It is hereby agreed that no obstacles shall be placed in the way of the construction or working of the telegraph by us or by our subordinates, provided always that the Company shall strictly observe and act up to the conditions of this Agreement; otherwise this concession shall be considered null and void.

Any disputes which may arise with respect to any of the clauses of this Agreement, or of the regulations of the telegraph, must be sent to Bangkok for final settlement by the Government of Siam and Her British Majesty's Consul.

Dated the day of the moon, month
year of Tiger, Siamese Civil Era 1228, and the 8th of the Decade, corresponding with Christian Era 1866.

REGULATIONS ATTACHED TO THE ABOVE AGREEMENT.

1. THE Concession granted to the Telegraphic Company is not to be ceded to any other Government or Company, without the knowledge and consent of the Siamese Government, under penalty of confiscation of the Concession and property.
2. The tariff of charges, as approved by other Governments, shall be submitted for the information of the Siamese Government.
3. The same privileges, granted to the most favoured Governments, shall be afforded to that of Siam.
4. The construction of the telegraphic lines, stations, &c., shall be entirely at the expense of the Company, and the Government of Siam shall not prevent, or put any difficulties in the way of procuring people who may be engaged or employed on the works of the said Company.
5. All property injured, habitations destroyed, or fruit trees in plantations cut down in the furtherance of the promotion of the line must be paid for, and the amount of compensation agreed either by mutual arrangement with the proprietor, or by arbitration.
6. The police of the line is to be in the hands of the Company; but the Siamese Government agree to frame such laws as shall punish thieves and depredators, or those who may tamper with the servants of the Company.
7. The Telegraphic Company shall have authority to clear a track not exceeding five fathoms in breadth, or less where necessary, and to cut down such trees and branches as may impede its operations; but should the line traverse gardens, houses, &c., compensation must be paid accordingly.
8. Should the telegraphic line pass through any chief town in the Siamese territory where the Government may deem it desirable to have a station, the said Company shall be bound to make one without demur.

Copy of this paper sent with the written approval of the Siamese Government for confirmation to the Rajah of—

Quedah.	Ranong.	Jangha.
Purlis.	Taknapa.	Trang.
Satoon.	Kraburi.	Pakkasir.

From Lieutenant Colonel *R. Macpherson*, Secretary to the Government of the Straits Settlement, to *E. C. Bayley*, Esquire, Secretary to the Government of India, Simla.—No. 16-593, dated Singapore, the 21st May 1866.

IN continuation of previous correspondence, I have the honour, by desire of his Honor the Governor, to forward herewith, for submission to his Excellency the Governor General in Council, copy of a communication, dated 19th instant, from Messrs. Paterson and Read transmitting a copy of the Concession to the Telegraph Company granted by his Highness the Tumongong of Johore, of which a transcript accompanied my letter, No. 13, of the 12th idem.

2. As already stated, his Honor has every reason to believe that a telegraph line between British Burmah and Singapore would prove highly useful both to the public and to the State, and would, therefore, earnestly beg to recommend the proposed scheme to favourable consideration.

From Messrs. *W. Paterson* and *W. H. Read*, to Lieutenant Colonel *R. Macpherson*, Secretary to the Government of the Straits Settlement; dated Singapore, the 19th May 1866.

WE have the honour to enclose copy of a Concession which has been granted to us by his Highness the Rajah of Johore to carry a line of telegraph through his territories, as part of a plan for constructing a telegraphic communication between Moulmein and Singapore, with branches to Bangkok, Saigon, and elsewhere, as may be hereafter determined, and to form a junction with the lines of telegraph in the Netherlands India Possessions.

Will you have the kindness to submit this to the honourable the Governor, with our request that he will use his influence to procure a confirmation of the Concession from the British Government, as stipulated for by the Rajah of Johore.

We may mention that it is proposed to carry out the plan by means of a Company to be registered under the "Indian Companies Act, 1866;" and we have already received such

assurances of support, that we have no doubt of being able at once to proceed with the construction of the line.

The sanction of Her Majesty's Government will be required to carry the line through the British territories in the Tenasserim Provinces and the Straits of Malacca; and we, therefore, venture to solicit his Honor's support in procuring such sanction. It is unnecessary for us to point out the importance to the Government and the public of the speedy opening of this line, and the additional facilities that it will afford, by a junction with the Netherlands India lines, of effecting a communication with Australia.

From *E. C. Bayley*, Esq., Secretary to the Government of India, Home Department, to the Governor of the Straits Settlement,—(No. 3359, dated Simla, the 3rd August 1866).

No. 9-336, dated
23 March.
No. 18, dated
12 May.
No. 16-593, dated
21 May.

I AM directed to acknowledge the receipt of the three letters, marginally noted, from your Secretary, on the subject of a proposal made by certain influential mercantile gentlemen at Singapore, for the formation of a company for the establishment of telegraphic communication between Moulmein and the several stations in the Straits.

2. In reply, I am desired to intimate that the Governor General in Council has no objections to the concessions offered to the proposed Telegraph Company by the King of Siam and the Tumongong of Johore, through whose territories a portion of the proposed line will pass; and a recommendation will therefore be made to Her Majesty's Government for the ratification of the terms offered by the King of Siam.

3. The Governor General in Council, I am also desired to state, is prepared to give every reasonable assistance and facility to the Company, when formed, in erecting that portion of the line which will pass through British Indian territory.

4. In regard to the terms to be given to the Company by the Government of India, I am desired to signify the general concurrence of the Government in the views expressed in the 3rd paragraph of your Secretary's letter, No. 9-336, dated the 23rd March last, and to intimate that the Governor General in Council will be prepared to consider specific proposals whenever submitted.

From *E. C. Bayley*, Esq., Secretary to the Government of India, Home Department, to the Officiating Director General of Telegraphs in India,—(No. 3360, dated Simla, the 3rd August 1866).

No. 9-336, dated
23 March.
No. 13, dated
12 May.
No. 16-59, dated
21 May.

I AM directed to forward to you the three letters, marginally noted, from the Secretary to the Government of the Straits Settlement, and of the reply this day communicated, having reference to a proposal for the establishment, by means of a private company, of telegraphic communication between Moulmein and the several stations in the Straits.

2. Pending the receipt of a further communication on the subject from the Government of the Straits Settlement, the Governor General in Council desires to have an expression of your opinion as to whether it will be necessary or expedient to embody in the license which may be granted to the proposed Company, a requirement (similar to that embodied in the railway telegraph licenses) regarding the adoption of the same system in respect of alphabet instruments, &c., as that in use on the lines of the Government Telegraph in India.

3. Unless a requirement of the kind under notice is really necessary (and his Excellency in Council doubts whether it be so), it is clearly undesirable to impose such a restriction.

(Home Department.—Electric Telegraph.—No. 36, of 1866.)

To the Right Honourable Viscount *Cranborne*, Secretary of State for India.

My Lord,

Simla, 18 September 1866.

* From Officiating Director General of Telegraphs, No. 2228, dated 13 August.
To Governor, Straits Settlement, No. 4546, dated 13 September 1866.

IN continuation of our Despatch No. 33, dated the 9th ultimo, we have the honour to transmit for your information copy of further correspondence* relating to the proposed establishment by a private company of telegraphic communication between Moulmein and the several stations in the Straits Settlements.

We have, &c.
(signed) *John Lawrence.*
W. N. Mansfield.
H. S. Maine.
W. Grey.
G. N. Taylor.
W. N. Massey.
H. M. Durand.

From Major *T. G. Glover*, R.E., Officiating Director General of Telegraphs in India, to the Secretary to the Government of India, Home Department, Simla (No. 2228, dated Calcutta, 13th August 1866).

IN reply to your No. 3360 of the 3rd instant, desiring my opinion with reference to the communication with the Government of the Straits Settlements relative to the establishment of telegraphic communication between Moulmein and Singapore by a private company, as to whether it will be necessary to insist on the adoption by them of the same system in respect of alphabet, instruments, &c., as that in use on the lines of the Government of India, I have the honour to state that the tendency of all national telegraph departments, communicating between adjacent States, is to assimilate the mode of working, nature of instruments, and alphabetical signs, as is evidenced by the late Brussels and Paris Conventions for the assimilation of working of the European lines. The advantage of this uniformity of system has further been conceded by the Indo-European line; and it will be the endeavour of this department, as opportunity offers, to assimilate its working, as far as local circumstances admit, to the same system. In an old-established department, like that of the Indian telegraphs, it is difficult to make these changes rapidly, involving, as they do, an entire change of instrument and method of signalling; but that it will ultimately be done, I am convinced, as soon as other and more pressing work is completed.

2. In a new department, however, like that of the company proposed to be established, no difficulty can exist to commencing on any system that may be considered advisable; and as the late Paris Convention is the result of the combined experience of telegraphy in Europe, I must suppose it is the best that can be adopted. Considering, therefore, that it is most advisable to effect uniformity as far as possible, and believing the European system the best that can be devised with our present knowledge, I would suggest that the clause now binding on railway telegraphs be inserted in the license that may be granted to the new Company, altering it, however, to the extent that the description of instruments, method of telegraphy, alphabetical system, mode of charging, &c., as proposed by the Paris Convention, be adopted; and that, in effect, the terms of that convention be generally binding on the Company; and that they be bound by this and any subsequent conventional rules that may from time to time issue.

From *A. M. Monteath*, Esq., Under Secretary to the Government of India, Home Department, to the Governor of the Straits Settlements (No. 4546, dated Simla, the 13th September 1866).

IN continuation of my letter (No. 3359), dated the 3rd ultimo, on the subject of the proposed establishment of telegraphic communication between Moulmein and the several stations in the Straits Settlements, I am directed to forward a copy of the correspondence noted in the margin with the Officiating Director General of Telegraphs in India, relative to the expediency or otherwise of embodying in the license which may be granted to the proposed Company, a requirement (similar to that embodied in the Railway Telegraph licenses) regarding the adoption of the same system in respect of alphabet, instruments, &c., as that in use on the lines of the Government Telegraph in India; and to intimate that, under the circumstances, perhaps the most appropriate course will be to require a general agreement that the Company will adopt such systems of instruments, alphabetical signs, &c., as the Government of India may prescribe.

To the Officiating
Director General of
Telegraphs in India,
No. 3360, dated
3 August.
From the Officiating
Director General of
Telegraphs in India,
No. 2228, dated
13 idem.

(No. 4547.)

COPY forwarded to the Officiating Director General of Telegraphs in India for information.

Sir, Foreign Office, 19 December 1866.

I HAVE laid before Lord Stanley your letter of the 13th instant, inclosing copies of a correspondence relative to the proposed scheme for laying a line of telegraph between Rangoon, Singapore, and Australia; and I am now directed by his Lordship to state to you, for the information of the Secretary of State for India in Council, that he is of opinion that the scheme in question should be approved.

Under these circumstances, I am to state to you, with reference to my letter of the 8th of June, and to your reply of the 14th of June, that, if Lord Cranborne sees no objection, Her Majesty's Consul in Siam will be authorised by the mail of the 26th instant to witness the agreement between the Siamese Government and the Company.

I am, &c.

The Under Secretary of State,
India Office.

(signed) *E. Hammond*.

Sir,

India Office, London, 22 December 1866.

IN reply to your letter of the 19th instant, on the subject of a proposed scheme for the construction of a line of telegraph between Rangoon, Singapore, and Australia, and with reference to your communication of the 8th June, and to Mr. Stansfeld's reply of the 14th June, I am directed by Lord Cranborne to state, for the information of Lord Stanley, that he entirely concurs in his Lordship's views as to the propriety of Her Majesty's Consuls in Siam being authorised to witness the agreement between the Siamese Government and the promoters of this scheme.

The Under Secretary of State for
Foreign Affairs.

I am, &c.
(signed) *Herman Merivale.*

Sir,

Foreign Office, 26 December 1866.

WITH reference to my predecessor's Despatch, No. 35, of 19th June, I transmit to you herewith copies of a further correspondence with the India Office on the subject of the proposed line of telegraph between Singapore, Rangoon, and Australia; and in accordance with the last letter in this correspondence, I have to authorise you to witness the agreement between the King of Siam and the Telegraph Company, respecting which point you asked instructions, in your Despatch, No. 22, of the 24th of April.

T. G. Knox, Esq.

To India Office,
19 December.
From India Office,
22 December.

COPY of POLITICAL DESPATCH to India (No. 10), dated 16th January 1867.

1. WITH reference to your letters in the Home (Electric Telegraph) Department, dated 9th August (No. 33), and 18th September (No. 36) 1866, I transmit herewith, for the information of your Excellency's Government, copy of correspondence with Her Majesty's Secretary of State for Foreign Affairs, and also with Mr. Seymour Clarke, on the subject of a scheme for the establishment of telegraphic communication between India and Australia, by way of Rangoon, Siam, and Singapore.

2. From a perusal of these papers, your Excellency will perceive that there is every disposition on the part of Her Majesty's Government to encourage this project, which, if successfully carried out, will be advantageous to the national interests.

3. I have to express, therefore, my approval of your Excellency's desire to afford every reasonable facility and assistance to the proposed Company for the prosecution of the experiment through British Indian Territory; and learn with much satisfaction the important concessions granted to the Company by the Kings of Siam and the Tumongong of Johore.

I have, &c.
(signed) *Cranborne.*

Sir *F. Rogers* to the Under Secretary of State, Foreign Office.

Sir,

Downing-street, 16 January 1867.

I AM directed by the Earl of Carnarvon to acquaint you that a copy of your letter of the 3rd instant, enclosing a correspondence relative to the proposed line of telegraph between Singapore, Siam, and Australia, has been forwarded, with its enclosures, for the information and consideration of the Lords Commissioners of the Treasury

The

The accompanying copy of a letter, which was addressed to their Lordships on the 8th instant, will explain to Lord Stanley the reason why this course has been adopted.

The Lords Commissioners have been requested to return the enclosures which accompanied your letter, in order that they may be sent back to the Foreign Office in accordance with your request.

The Under Secretary of State
for Foreign Affairs.

I am, &c.
(signed) *Frederic Rogers.*

8 Jan. 1867.

Mr. E. Hammond to the Under Secretary of State, Colonial Office.

Sir, Foreign Office, 18 January 1867.

With reference to your letter of the 16th of January, forwarding a copy of a letter to the Treasury on the subject of the proposed line of telegraph between Singapore, Siam, and Australia, I am directed by Lord Stanley to state to you that he concurs with Lord Carnarvon's view, as expressed in that letter, that the Treasury should deal with all such matters, on the understanding, however, that the Foreign Office should be consulted before any decision is taken affecting telegraphic communication with foreign countries.

The Under Secretary of State,
Colonial Office.

I am, &c.
(signed) *E. Hammond.*

Sir F. Rogers to the Secretary to the Treasury.

Sir, Downing-street, 9 February 1867.

I AM directed by the Earl of Carnarvon to transmit to you, for the consideration of the Lords Commissioners of the Treasury, and with reference to previous correspondence on the same subject, a copy of a letter from the Board of Admiralty on the subject of Mr. Gisborne's proposals respecting telegraphic communication with Singapore, China, and Australia.

The Lords of the Admiralty have been informed that their letter has been forwarded for the consideration of the Lords Commissioners of the Treasury, in accordance with the arrangements proposed in my letter of the 8th January, in which Lord Carnarvon assumes their Lordships' concurrence.

The Secretary, Treasury.

I am, &c.
(signed) *Frederic Rogers.*

Sir F. Rogers to the Secretary to the Admiralty.

Sir, Downing-street, 8 January 1867.

I AM directed by the Earl of Carnarvon to transmit to you, for the information of the Lords Commissioners of the Admiralty, a copy of a letter from Mr. F. Gisborne, forwarding a copy of resolutions adopted by gentlemen who are willing to form a company for the extension of telegraphic communication with Singapore, China and Australia, together with a copy of the answer returned to Mr. Gisborne by his Lordship's desire.

The Lords Commissioners will find that by the 4th resolution, Her Majesty's Government are requested to cause soundings to be taken between Eastern Java, Celebes, Timor, and Port Essington.

The Secretary to the Admiralty.

I am, &c.
(signed) *Frederic Rogers.*

27 Nov. 1866.

31 Dec. 1866.

(G. 11,343/66.)

Lord *Henry G. Lennox* to the Under Secretary of State, Colonial Office.

Sir,

Admiralty, 1 February 1867

WITH reference to your letter of the 8th ultimo, enclosing copy of a letter from Mr. Gisborne forwarding a copy of resolutions adopted by gentlemen who are willing to form a company for the extension of telegraphic communication with Singapore, China, and Australia, and calling attention to the 4th resolution wherein Her Majesty's Government is requested to cause soundings to be taken between East Java, Celebes, Timor, and Port Essington, I am commanded by my Lords Commissioners of the Admiralty to request you will move the Earl of Carnarvon to cause me to be informed whether he considers this service ought to be undertaken at the expense of the Admiralty for a private company.

My Lords desire me to state that it will occupy about one year to complete the service, for which purpose the two surveying vessels, now employed in China, would have to be withdrawn from their regular duties.

The Under Secretary of State
for the Colonies.

I am, &c.

(signed) *Henry G. Lennox.*Mr. *Adderley* to Mr. *F. Gisborne*.

Sir,

Downing-street, 6 February 1867.

I AM directed by the Earl of Carnarvon to acknowledge the receipt of your letter of the 21st ultimo, embodying proposals as to the amount and nature of Government aid which, in your opinion, should be granted to the extension of telegraphic communication in the East.

In accordance with what was stated to you in my letter of the 31st December, a copy of your letter has been sent for the consideration of the Lords Commissioners of the Treasury.

F. Gisborne, Esq.

I am, &c.

(signed) *C. B. Adderley.*Sir *F. Rogers* to the Secretary of the Treasury.

Sir,

Downing-street, 6 February 1867.

I AM directed by the Earl of Carnarvon to transmit to you, for the consideration of the Lords Commissioners of the Treasury, and with reference to previous correspondence on the same subject, a copy of a letter from Mr. Gisborne, respecting the grant of Government aid to the proposed extension of telegraphic communication to Singapore, China, and Australia.

To the Secretary of the Treasury.

I am, &c.

(signed) *F. Rogers.*Sir *F. Rogers* to Mr. *G. A. Hamilton*.

Sir,

Downing-street, 30 January 1867.

I AM directed by the Earl of Carnarvon to transmit to you, for the consideration of the Lords Commissioners of the Treasury, a copy of a Despatch from the Governor of Queensland respecting telegraphic communication with Australia, and the extension of the electric telegraph in that Colony.

G. A. Hamilton, Esq.,
&c. &c. &c.

I am, &c.

(signed) *Frederic Rogers.*

No. 62.
13 Nov. 1866.

(Enclosure.)

(No. 62.)

Sir *G. F. Bowen* to the Earl of *Carnarvon*.

Government House, Brisbane, Queensland.

13 November 1866.

My Lord,

As the question of the extension of the electric telegraph to Australia appears to have excited some interest during the recent Session of the Imperial Parliament, I beg to solicit your lordship's attention to the information contained on this subject in several of my previous despatches, addressed to your predecessors, and especially in paragraphs 8 and 9 of my despatch No. 62, of 12th September 1865, and in the Report of a Joint Select Committee of both Houses of the Queensland Parliament, transmitted therewith.

2. The intercolonial telegraphic line is already open as far as the town of Bowen, at Port Denison, near the 20th parallel of south latitude. All the principal centres of population in the four great colonies of Queensland, New South Wales, Victoria, and South Australia are now in immediate communication with each other. Among the numerous advantages derived, directly and indirectly, from this fact, not the least important is the ready means thus afforded for communication between the seat of Government and the outlying districts in each of these vast territories. For example, the public officers at Gladstone, Rockhampton, Mackay, Bowen, and the other northern ports of Queensland, though separated by enormous distances from Brisbane, can apply for, and receive in the course of a few hours, from the heads of their respective departments, full instructions for their guidance in all emergencies that may arise. If, in addition to the facilities afforded by the electric telegraph, and by the coasting steamers, the inhabitants of the northern district of this colony would generally avail themselves of the powers of local self-government, provided by the "Municipal Institutions Act" (28 Vict. No 21), and by the "Provincial Councils Act" (28 Vict. No 23), the inconveniences of their geographical position would be almost entirely removed, and the erection of a new colony in North-Eastern Australia would be delayed for an indefinite period.

See Statutes
Queensland, Vol. •
III., pages 229
and 258.

3. I may take this opportunity of mentioning that on the last return trip of the mail steamer between Brisbane and Batavia, which has been subsidised during the present year by the Government of Queensland, news from London was brought to Port Denison, via Singapore and Torres Straits, in 33 days. The heads of the intelligence thus conveyed comprising the important items of the peace between Prussia and Austria, and of the reduction of the rate of discount at the Bank of England from 10 to 5 per cent.), were immediately forwarded by telegraph from Port Denison to Brisbane, Sydney, Melbourne, and Adelaide, and appeared on the following morning in the journals of those capitals.

4. It will have been seen from my previous despatches, that, so soon as there shall appear any immediate prospect of the extension of the electric telegraph from India and Singapore to Australia, the Government and Parliament of Queensland will be prepared to extend, at the cost of this colony, the telegraphic wires from Port Denison to Burke Town, at the head of the Gulf of Carpentaria, or to whatever point on the northern coast of this continent it may be finally decided to bring the projected submarine line, which will, ere long, unite the Australasian group of colonies with Asia and Europe.

I have, &c.

(signed) *G. F. Bowen*.

The Right Hon.
The Earl of Carnarvon.

Mr. *Seymour Clarke* to the Under Secretary of State for India.

The Great Northern Railway,
General Manager's Office, King's Cross Station,
London, 6 April 1868.

Sir,

You were so very kind to me, on the occasion of my asking information of the Secretary of State for India, as to concessions granted to certain parties for carrying a line of telegraph through the kingdom of Siam, that I now venture to trouble you again on this subject, and, referring to the Treasury Minute of the 10th January, 1867, my friends are desirous to know what aid they might expect, in the event of their undertaking to carry the line from Rangoon southwards, through the Tenasserim Provinces, to connect with the Dutch system through Sumatra, &c., and eventually to Australia and China.

In using the word "aid," I do not, after what has been decided, mean pecuniary aid. But this might be given, either in the way of privileges in connection

nection with the line from Calcutta to Rangoon, or by the sale of that telegraph to the promoters of the contemplated extension southwards, so as to form one scheme between Calcutta and the above-named important places.

I am, &c.
(signed) *Seymour Clarke.*

The Under Secretary of State for India.

The Under Secretary of State for India to Mr. *Seymour Clarke.*

Sir,

India Office, 24 April 1868.

I AM directed to acknowledge receipt of your letter of the 6th instant, and to acquaint you in reply, that, before coming to any conclusion on the subject therein referred to, Sir Stafford Northcote must communicate with the Government of India. On receipt of a reply to the reference about to be made to that Government, a further communication will be made to you.

S. Clarke, Esq.

I am, &c.
(signed) *Clinton.*

(Telegraph, No. 21.)

To His Excellency the Right Honourable the Governor General of India in Council.

Sir,

India Office, London, 30 April 1868.

Para. 1. HEREWITH is transmitted a copy of a letter dated 6th April 1868, from Mr. Seymour Clarke, inquiring what aid the Government of India would be willing to extend to promoters of a line of telegraph to connect the Indian system at Rangoon with the Dutch system at Sumatra.

2. Before replying definitely to this inquiry, I wish to be informed whether any and what assistance, in your opinion, might properly be afforded by Government to any substantial company formed for the purpose in question.

I have, &c.
(signed) *Stafford H. Northcote.*

TELEGRAPHIC COMMUNICATION
(EAST INDIA, &c.)

COPY of CORRESPONDENCE and PAPERS relating
to the Establishment of TELEGRAPHIC COMMU-
NICATION between *India*, *Singapore*, *China*, and
Australia, since the 21st February 1865 (in con-
tinuation of PAPERS communicated in the Ses-
sion of 1865).

(*Mr. Edward Hamilton.*)

Ordered, by The House of Commons, to be Printed,
16 June 1868.

RETURN to an Address of the Honourable The House of Commons,
dated 8 June 1868 ;—for,

“ RETURNS showing the OUTLAY by the Government of *India* on the Lines of TELEGRAPH in *Persia*, in the *Persian Gulf*, and in the *Arabian Sea* :”

“ And, showing the REVENUE and EXPENDITURE of these Lines since their opening in February 1868.”

India Office,
19 June 1868. }

W. T. THORNTON,
Secretary, Public Works Department.

(No. 176.)

INDO-EUROPEAN TELEGRAPH DEPARTMENT.

MEMORANDUM.

London Office, 18 June 1868.

THE outlay by the Government of India on the lines of telegraph in Persia, the Persian Gulf, and Arabian Sea, having been made partly in this country and partly in the east, it will be necessary to await returns from India, before a full and accurate account of it can be submitted.

In the meantime, however, an estimate of the expenditure and revenue, based upon the returns in this office, has been prepared, which it is believed will show very nearly the cost of the lines and the income derivable from them.

Estimate of Cost of Lines in Persia	-	-	-	-	-	£.
						100,000
Yearly Working Expenses:						£.
Salaries	-	-	-	-	-	16,000
Contingencies	-	-	-	-	-	4,000
						£. 20,000

By treaty with Persia, it is stipulated that the cost of the lines is to be refunded to the Indian Government, and that the receipts for the transmission of messages devolve to Persia, so long as they are within 30,000 toman (13,000 *l.*) per annum, beyond which sum they go towards defraying the expenses of the English working establishment; but as they have hitherto been considerably within this amount, it will be seen that the Government of India, for the sake of strengthening its communication with Europe, has, besides having advanced 100,000 *l.* for a line through Persia, paid 20,000 *l.* a year to work it, without any return whatever; it is, however, expected that, on the completion of the new Indo-European Line *via* Russia, the passage of messages through

through Persia will greatly increase, and that the line will then no longer be worked at a loss.

ESTIMATE of Cost of Persian Gulf, Arabian Sea, and Mekran Coast Lines.

	£.
Cost of cable, including supervision during manufacture and laying - - - - -	234,965
Cost of steamer for maintenance and repairs - - - - -	18,140
Salaries paid in England during manufacture of cable, and passage money to India - - - - -	14,126
Shipping for conveyance of cable to India and laying - - - - -	125,719
Buildings for stations and dwelling houses - - - - -	50,000
Instruments, batteries, and furniture for stations - - - - -	12,000
Land line from Kurrachee to Gwadar on Mekran coast - - - - -	40,000
	<u>£. 494,950</u>

Yearly Expenses in Persian Gulf, and at Offices of Account and Control :

	£.
* In Persian Gulf. Salaries* - - - - -	34,800
Stores,* subsidies, and contingencies - - - - -	26,000
Cost of Constantinople Account Office - - - - -	1,600
Cost of London Office - - - - -	1,200
	<u>£. 63,600</u>

Yearly revenue - - - - - £. 92,000

Yearly profit on Persian Gulf Line, without taking into }
account the yearly deterioration of cable - - - - - } £. 28,400

In addition to the above expenditure, the Government of India is now engaged in extending the Mekran coast land line to Jask, and in arranging for the manufacture of a cable to be laid from Jask to Bushire. This work will, it is expected, be accomplished during next winter ; when finished, there will be two entirely separate lines of telegraph from India to Europe.

A. Brasher, Superintendent,
London Office.

RETURN showing the OUTLAY by the Government of *India* on the Lines of TELEGRAPH in *Persia*, in the *Persian Gulf*, and in the *Arabian Sea*; and, showing the REVENUE and EXPENDITURE of these Lines since their Opening in February 1868.

(*Lord William Hay.*)

*Ordered, by The House of Commons, to be Printed,
22 June 1868.*

SUEZ AND INDIA TELEGRAPH.

RETURN to an Address of the Honourable The House of Commons,
dated 3 December 1867;—for,

- “COPIES of the MEMORIAL lately presented by BANKERS and MERCHANTS of the City of *London*, recommending the laying of a SUBMARINE TELEGRAPH between *Suez* and *India* by the *Red Sea*:”
- “And, of the PROPOSAL made by the Submarine Telegraph Construction and Maintenance Company upon the same subject.”

India Office, }
6 December 1867. }

W. T. THORNTON, Secretary,
Public Works Department.

— No. 1. —

MEMORIAL from Bankers and Merchants of the City of *London*.

To the Right Honourable Sir *Stafford Northcote*, Bart., M.P., Her Majesty's Secretary of State for India in Council.

Sir,

London, 7 November 1867.

EARLY in the Session of 1866 the attention of the House of Commons was directed to the practical working of the postal and telegraphic communication between this country and India, and a Select Committee, of which Mr. Crawford, the Member for the City of London, was the Chairman, was appointed to inquire into the whole subject.

Both the Home and Indian Governments were most efficiently represented upon this Committee, as were also the interests of commerce and of science, in especial relation to telegraphy.

The questions thus referred to this Committee were thoroughly examined, with the assistance of many competent and experienced witnesses, and the result was finally submitted to the House of Commons in an exhaustive report bearing date the 20th July 1866.

Passing by the question of postal communication, with which this letter does not propose further to deal, we desire with great respect to call your attention to the important subject of the telegraphic connection of this country with India and the Eastern world generally.

The existing methods of carrying on those communications were described by the Committee as imperfect in their organisation, inefficient in their working, and liable at any time to interruption from political and other causes entirely beyond the control of the British Government; and at the same time the advantages of telegraphic intercourse with India, in relation to its trade with this country, were fully set forth upon the evidence of the very competent witnesses who appeared before the Committee.

A proposition for the establishment of an independent line of telegraph, by way of Egypt, was submitted to, and favourably noticed by the Committee, as comprising within itself the great desideratum of setting free the intercommunication from the risk of political complications, in a much greater degree than can be the case under present circumstances, and the advantage of its management being preserved almost exclusively throughout under British authority.

This scheme was subsequently embodied in the formal propositions of a Company, entitled “The Anglo-Indian Telegraph Company, Limited,” constituted for the purpose of carrying it into effect, but owing to the state of the share market, and the distrust which has followed upon the events of the past year, the Directors have not, we are informed, as yet succeeded in obtaining subscriptions sufficient to justify their proceeding with the enterprise.

Such being the case, we learn that the Anglo-Indian Telegraph Company has addressed to you a memorial asking Her Majesty's Government to support the undertaking by a guarantee of interest, at the rate of five per centum per annum, on a capital of 1,000,000 *l.* sterling, to be applied to the special purpose

of establishing the proposed line, upon the understanding that the Company shall lease the Persian Gulf Line from the Indian Government, at a rental of five per centum per annum on the cost of its construction, and adopt as between itself and Her Majesty's Government the liability of relieving the Exchequer of the burden of the Red Sea Annuities, amounting to 36,000 *l.* per annum, the Company accepting the same as a first charge upon the net profits from the working of the lines.

Considering the magnitude of the political, social, and other interests than those of commerce which are bound up in the maintenance of the existing relations between this country and India, we humbly submit that the policy of the establishment of a complete and effective system of telegraphic communication, such as that suggested, may be advocated upon grave and important grounds of an Imperial character, and we pray therefore that the proposal may receive the earnest and favourable consideration of Her Majesty's Government, with a view to its being carried into effect in the manner pointed out, or by such other means as the Government may deem most advisable.

It is hardly necessary to point out how valuable such a communication by the Red Sea would be during the period of the operations of our troops in the Abyssinian expedition.

We have, &c.

(signed) *N. de Rothschild & Sons.*
Matheson & Co.
Fred. Huth & Co.
J. Henry Schröder & Co.
Ashton & Co.
Crawford, Colvin, & Co.
Brown, Shipley, & Co.
T. A. Gibbs & Co.
Blyth, Greene, & Co.
J. S. Morgan & Co.
 For the Oriental Bank Corporation,
Charles J. F. Stuart, Chief Manager.
 For the Chartered Mercantile Bank of India, London, and China,
D. T. Robertson, Chief Manager.
 For the Bank of New South Wales,
John Currie, Secretary.
Stern Brothers.
Fruhling & Goschen.
W. F. Allen, Lord Mayor of London.
Forbes, Forbes, & Co.
 For the National Bank of India (Limited),
A. F. Hewett, Manager.
 For the Union Bank of Australia,
W. R. Newburn, Secretary.
 For the Peninsular and Oriental Steam Navigation Company,
C. W. Howell, Secretary.
J. Thomson, T. Bonar, & Co.
 For the Bank of Australasia,
W. Milliken, Secretary.
 For the London Chartered Bank of Australia,
W. M. Young, Secretary.
 For the Chartered Bank of India, Australia, and China,
G. M. Adam, Manager.
Gregson & Co.
Gladstone, Ewart, & Co.
Drake, Kleinwort, & Cohen.
Finlay, Campbell, & Co.
Horstman & Co.
Robert Benson & Co.
Barclay, Bevan, Tritton, & Co.
Harvey, Brand, & Co.
 For the Comptoir D'Escompte de Paris,
C. G. Putsch, Agent.
J. W. Cater, Sons, & Co.
Henry W. Eaton & Sons.
Gledstones & Co.
J. Swaine & Co.
Smith, Fleming, & Co.
Alston Brothers.
 For the London, Asiatic, and American Company (Limited),
John Saisons, Director.

— No. 2. —

From the Managing Director of the Telegraph Construction and Maintenance Company, to the Secretary of State for India.

Sir,

54 Old Broad-street, 11 November 1867.

WITH a view to place on official record the proposition which I had the honour privately to make to you some time since, of establishing a telegraphic communication, in continuation of the existing one from London (*vid* Malta) to Suez, down the Red Sea, to Massowah, I beg to be allowed to recapitulate the arguments in favour of such a submarine telegraph, and the terms on which it could be manufactured and laid.

Her Majesty's forces employed in the Abyssinian expedition will, the moment they leave Bombay harbour, be cut off from all telegraphic communication with India and England.

When in Abyssinia, the fleet and army will be five days' steaming distance, for a fast vessel, from Suez, and 10 days from Bombay.

The necessity of telegraph facilities for the force is so well recognised in India, that 500 miles of materials and a staff of operators are engaged to connect head quarters, when in the interior of Abyssinia, with the fleet on the sea coast.

From that port, Massowah, for instance, the intelligence from the army, or the orders of the Home Government, if sent to Suez, must be five days travelling in a despatch boat.

Supposing that one telegram be sent daily each way to and from Suez, five despatch boats going south and five going north will be needed, at a cost which I have no hesitation in saying will exceed that of a telegraph cable, leaving out of the question the risk to the vessels, and the delays incident to such a navigation.

Between Massowah Bay, Aden, and India, without a telegraphic communication be effected, a similar stream of vessels must be kept going and coming, at a cost which, if reduced to figures, would be startling. And, without a telegraph, the question of supplies for the army, assistance in the event of reverses, or the means of withdrawing the force rapidly, should the Ministry at home or the Government in India deem it necessary, will be, as every one must allow, uncertain, tardy, and costly.

This Company happens, from the following circumstances, to be in a position to assist Her Majesty's Government in this matter.

Ever since we succeeded in submerging the Atlantic Telegraph Cables, measures have been slowly but steadily taken by this Company to bring about, sooner or later, as expeditious and safe a means of telegraphing to India from London as we have to the United States of America,—to lay, in short, a cable from Suez to Bombay.

With this view, machinery and materials to a very large amount have been prepared by the Telegraph Construction Company, and, but for the great financial and commercial depression of the last year, this important public undertaking would have been carried out at once.

We think, however, that the wants of Her Majesty's Government may be worked in with the terms of the enterprise above alluded to, and I am authorised to say that this Company will undertake to make and lay a cable from Suez to Massowah, for about 300,000 *l.* sterling, within four months, if the order be given by the 1st of December; and that, when the Government shall have no further need of the cable, from the expedition being withdrawn, we will undertake, in combination with a Company of satisfactory credit and position, to lease the said cable from Government, on fair and equitable terms, and connect it with the port of Aden, with a view to continuing it as a submarine telegraphic communication to Bombay.

By this means we would point out to Her Majesty's Government that a certain amount of the expenditure being incurred for the Abyssinian expedition might be considered as covered by a guaranteed interest, and Her Majesty's Treasury would have their present property in submarine cable in the Mediterranean much improved.

So much time has been lost, that we are not prepared to make any offer for connecting

connecting Bombay with Aden before the next stormy monsoon, but, should the rains in May next set in before the British forces are withdrawn from Abyssinia, we feel certain that the safety of the army will much depend upon such a telegraphic communication being speedily established, and I see no reason to doubt that the Bombay section would be laid by private enterprise in October next, if Her Majesty's Government accept the proposition for the Red Sea section which I have now the honour to submit to your favourable consideration.

I have, &c.
 (signed) *Sherard Osborn*, Captain, R.N.,
 Managing Director.

SUEZ AND INDIA TELEGRAPH.

COPIES of the MEMORIAL lately presented by BANKERS and MERCHANTS of the City of London, recommending the laying of a SUBMARINE TELEGRAPH between *Suez* and *India* by the *Red Sea*; and, of the PROPOSAL made by the Submarine Telegraph Construction and Maintenance Company upon the same subject.

(*Mr. O'Beirne.*)

Ordered, by The House of Commons, to be Printed,
14 February 1868.

61.

Under 1 oz.

EAST INDIA (ELECTRIC TELEGRAPHS).

RETURN to an Address of the Honourable The House of Commons,
dated 22 June 1868 ;—for,

- “ COPIES of the ACT of the Legislative Council of *India* vesting a monopoly of TELEGRAPHS in the Government of *India*, and of any ACT amending the same :”
- “ Of the CORRESPONDENCE between the Indian Railway Companies and the Indian Authorities, resulting in the Arrangement between them for the employment of the RAILWAY TELEGRAPHS by the Public in *India* :”
- “ RETURN of EXPENDITURE in *England* and *India* on account of the ELECTRIC TELEGRAPHS in *India* ; showing the Amount expended yearly on Account of Permanent Works and Annual Maintenance and Expenses :”
- “ ACCOUNT of the ANNUAL RECEIPTS from the TELEGRAPHS, and of the Number of Miles of TELEGRAPH and of STATIONS open in each Year :”
- “ And, COPY of the ANNUAL REPORTS of the INDIAN TELEGRAPH DEPARTMENT (in continuation of Parliamentary Paper, No. 20, of Session 1866).”

India Office, }
15th July 1868. }

E. P. A. THOMPSON,
Assistant Secretary, Public Works Department.

(*Mr. Ayrton.*)

Ordered, by The House of Commons, to be Printed,
16 July 1868.

COPIES of the Act of the Legislative Council of *India* vesting a monopoly of TELEGRAPHS in the Government of *India*, and of any ACT amending the same:—Of the CORRESPONDENCE between the Indian Railway Companies and the Indian Authorities, resulting in the Arrangement between them for the employment of the RAILWAY TELEGRAPHS by the Public in *India*:—RETURN of EXPENDITURE in *England* and *India* on account of the ELECTRIC TELEGRAPHS in *India*; showing the Amount expended yearly on account of Permanent Works and Annual Maintenance and Expenses:—ACCOUNT of the ANNUAL RECEIPTS from the TELEGRAPHS and of the Number of Miles of TELEGRAPH and of STATIONS open in each year:—And, COPY of the ANNUAL REPORTS of the INDIAN TELEGRAPH DEPARTMENT (in continuation of Parliamentary Paper, No. 20, of Session 1866.)

ACT No. XXXIV., of 1854,

Passed by the Legislative Council of India (received the assent of the Governor General on the 23rd of December 1854), being an Act for regulating the establishment and management of Electric Telegraphs in India.

WHEREAS it is expedient that provision should be made for regulating the establishment and management of lines of Electric Telegraph in India, it is enacted as follows:— Preamble.

I. Within the territories in the possession and under the government of the East India Company, the said East India Company shall have the exclusive privilege of establishing lines of Electric Telegraph: Provided that the Governor General of India in Council may grant a license to any person or company to establish a line of Electric Telegraph within any part of such territories, which license shall be revocable on the breach of any of the conditions therein contained. The East India Company to have the exclusive privilege of establishing Electric Telegraphs. Proviso.

II. Whoever shall, otherwise than under a license duly granted as aforesaid, establish or, after revocation of such license, maintain a line of Electric Telegraph within the said territories, shall be liable to a fine not exceeding 1,000 rupees; and for every week during which such line shall be maintained shall be liable to a further fine not exceeding 500 rupees. Penalties for establishing or maintaining unauthorised Electric Telegraphs.

III. Whoever shall use a line of Electric Telegraph, knowing or having reason to believe that it is an unlicensed line, for the purpose of sending or receiving messages, or shall perform any service incidental thereto, shall, for every such offence, be liable to a fine not exceeding 50 rupees. Penalty for using or working such Telegraphs.

IV. The Governor General of India in Council may, on the occurrence of any public emergency, take temporary possession of any line of Electric Telegraph established under license within the said territories. Government may take possession of Telegraphs established by license.

V. Any railway company, on being required so to do by the Governor General of India in Council, shall permit the Government to establish upon the land of such company adjoining the line of railway a line of Electric Telegraph, and shall give every reasonable facility for establishing and using the same. Government may establish Telegraph on land of railway company.

VI. The Governor General of India in Council may from time to time frame rules for the conduct of Electric Telegraphs established by Government not inconsistent with this Act, and therein prescribe the regulations, conditions, and restrictions according to which all messages and signals shall be transmitted. Governor General in Council to frame rules for the conduct of Government Telegraphs.

Government not responsible for loss or damage.

VII. The Government shall not be responsible for any loss or damage which may occur in consequence of any person employed by the Government in the Electric Telegraph department failing to transmit with accuracy any message entrusted to him for transmission, and no such person shall be responsible for any such loss or damage, unless he shall cause the same negligently, maliciously, or fraudulently.

No person to intrude into a Telegraph office.

VIII. Whoever shall without permission enter into a Government Telegraph office, or shall refuse to quit the same on being requested to do so by any officer or servant employed therein, or shall wilfully obstruct or impede any such officer or servant in the performance of his duty, shall be liable to a fine not exceeding 100 rupees.

Penalties for cutting the line.

IX. Whoever shall wilfully cause or attempt to cause any interruption to the transmission of signals along a line of Electric Telegraph established by the Government, by cutting or injuring the wire, or by injuring any portion of the line, or any instrument or apparatus, or by any other means, shall be liable to be imprisoned, with or without hard labour, for a term not exceeding two years, or to fine, or to both.

Injuring posts, &c.

X. Whoever shall wilfully or negligently damage or injure any post or any portion of the line of such Electric Telegraph, shall be liable to a fine not exceeding 50 rupees.

Penalties for fraudulently omitting to transmit messages or for disclosing secret messages.

XI. Whoever, being in the employ of the Government in the Electric Telegraph department, shall fraudulently or maliciously secrete, make away with, alter, or omit to transmit any message which he may have received for transmission, or shall fraudulently or maliciously disclose any message so received by him and directed to be kept secret, shall be liable to be imprisoned, with or without hard labour, for a term not exceeding two years, or to fine, or to both.

Penalty for misconduct.

XII. Whoever being in such employ shall be guilty of any act of drunkenness, carelessness, or other misconduct, whereby the transmission or delivery of any message shall be endangered, or who shall loiter or make delay in the transmission or delivery of any message, shall be liable to a fine not exceeding 100 rupees.

Penalties for sending messages without payment to Government.

XIII. Whoever being in such employ shall transmit by the Electric Telegraph any message upon which the prescribed charge has not been paid, intending thereby to defraud the Government, shall be liable to be imprisoned, with or without hard labour, for a term not exceeding two years, or to fine, or to both.

Penalties for transmission of fabricated messages.

XIV. Whoever shall fraudulently or maliciously transmit or cause to be transmitted by an Electric Telegraph established by Government a message which he knows to be false or fabricated, shall be liable to be imprisoned, with or without hard labour, for a term not exceeding two years, or to fine, or to both.

Persons other than European British subjects liable to be punished.

XV. Any person not being a European British subject, who shall, beyond the local limits of the jurisdiction of Her Majesty's Supreme Court of Judicature, commit any of the offences mentioned in Sections IX., XI., XIII. and XIV. of this Act, shall be punishable upon conviction by any magistrate within whose jurisdiction the offence shall be committed.

Fines how to be recovered.

XVI. Any person, whether a European British subject or not, who shall be guilty of any offence, for which, according to the provisions of this Act, he shall be liable to a fine only, shall be punishable for such offence by any justice of the peace for any of the Presidency towns of Calcutta, Madras, and Bombay, or for any of the settlements of Prince of Wales' Island, Singapore, and Malacca, magistrate, joint magistrate, or person, lawfully exercising the powers of magistrate, within whose jurisdiction the offence shall be committed; and any person hereby made punishable by a justice of the peace shall be punishable upon summary conviction.

Conviction to be quashed on merits only. Form of conviction, &c.

XVII. No conviction, order, or judgment of any justice of the peace shall be quashed for error of form or procedure, but only on the merits; and it shall not be necessary to state on the face of the conviction, order, or judgment, the evidence on which it proceeds; but the depositions taken, or a copy of them, shall be returned with the conviction, order, or judgment, in obedience to

to any writ of *certiorari*; and if no jurisdiction appears on the face of the conviction, order, or judgment, but the depositions taken supply that defect, the conviction, order, or judgment, shall be aided by what so appears in such depositions.

XVIII. A magistrate may refer for trial and decision any charge of an offence hereby made punishable by fine only, to any of his assistants or to any deputy magistrate lawfully appointed to exercise the powers of a covenanted assistant, and in such case, every such assistant or deputy magistrate may exercise all the powers vested in a magistrate, subject to all the rules applicable to criminal cases deputed to such assistants or magistrates acting judicially.

Magistrate may refer charge to his assistants.

XIX. The local government may give general authority to any such assistant or deputy magistrate to exercise, without reference by a magistrate, any of the powers which they are hereby rendered competent to exercise upon reference by a magistrate, subject to appeal to the magistrate from any conviction by such assistant or deputy magistrate, within one month from the date of the conviction: Provided that a magistrate may at any time call from any of his assistants, or from any deputy magistrate subordinate to him, any case pending before such assistant or deputy magistrate.

Government may authorise assistant and deputy magistrates to exercise certain powers.

XX. All fines imposed under the authority of this Act, for offences punishable by fine only, by any justice of the peace, magistrate, joint magistrate, or person lawfully exercising the powers of a magistrate, or by any assistant to a magistrate or deputy magistrate, may, in case of non-payment thereof, be levied by distress and sale of the goods and chattels of the offender, by warrant under the hand of any of the above-named officers; and in case any such fine shall not be forthwith paid, any such officer may order the offender to be apprehended and detained in safe custody until the return can be conveniently made to such warrant of distress, unless such party shall give security to the satisfaction of such officer for his appearance at such place and time as shall be appointed for the return of the warrant of distress, and such officer may take such security by way of recognisance or otherwise; and if, upon the return of such warrant, it shall appear that no sufficient distress can be had whereon to levy such fine, and the same shall not be forthwith paid; or in case it shall appear to the satisfaction of such officer, by the confession of the party or otherwise, that he has not sufficient goods and chattels whereupon such fine or sum of money could be levied if a warrant of distress were issued, any such officer, by warrant under his hand, may commit the offender to prison, there to be imprisoned only, or to be imprisoned and kept to hard labour, according to the discretion of such officer, for any term not exceeding two calendar months where the amount of the fine shall not exceed 50 rupees, and for any term not exceeding four calendar months where the amount shall not exceed 100 rupees, and for any term not exceeding six calendar months in any other case; the commitment to be determinable in each of the cases aforesaid on payment of the amount.

Fines how levied.

Imprisonment no sufficient distress, &c.

XXI. If any servant of the East India Company, employed in the Electric Telegraph Department, within the dominions of any foreign Prince or State in alliance with the said company, in which an Electric Telegraph is established by the said company, shall, within the dominions of such Prince or State, commit any act hereby prohibited, or omit to do any act hereby required to be done by any person similarly employed within the territories under the government of the said company, such servant of the said company shall be guilty of an offence, and on conviction thereof, shall be punished in the same manner as if such act had been done or omitted within the said last-mentioned territories; and every such person may be tried, convicted, and punished either by fine or otherwise, according to the nature of the offence, by any court or officer duly empowered by the Governor General of India in Council to take cognisance of offences committed in such dominions by servants of the East India Company, or by any court or magistrate or other competent officer in any part of the territories within the Government of the East India Company, in the same manner as if the offence had been committed in such part of the said territories.

Authority to punish servants of the East India Company who commit offences against this Act in foreign territory.

XXII. The word "Magistrate" in this Act shall include joint magistrates and persons lawfully exercising the powers of magistrates, and the word "Fine" shall include a penalty or forfeiture.

Explanation of terms.

Government to
frame rules for tele-
graphs established
by license.

XXIII. It shall be lawful for the Governor General in Council to frame rules for the conduct of any Electric Telegraph established by license under this Act, and to declare from time to time what portions of this Act shall be applicable to such telegraph, and to persons using the same or employed in connexion therewith.

ACT No. VIII., of 1860,

Passed by the Legislative Council of India (received the assent of the Governor General on the 12th March 1860), being an Act for regulating the establishment and management of Electric Telegraphs in India.

Preamble.

WHEREAS it is expedient that better provision should be made for regulating the establishment and management of lines of Electric Telegraph in India ; it is enacted as follows :—

Act repealed.

I. Act XXXIV. of 1854 (*for regulating the establishment and management of Electric Telegraphs in India*) is hereby repealed, except as to any act or offence which shall have been done or committed, or to any fine or penalty which shall have been incurred, or to any proceedings which shall have been commenced, before this Act shall come into operation, and except also as to any license for the establishment of a line of Electric Telegraph granted under the said Act. All things done under the authority or in pursuance of the said Act, shall be as valid and effectual as if this Act had not been passed.

Governor General
in Council to have
the exclusive privi-
lege of establishing
Electric Telegraphs.
Proviso.

II. Within the British territories in India, the Governor General of India in Council shall have the exclusive privilege of establishing lines of Electric Telegraph : Provided that the Governor General of India in Council may grant a license to any person or company to establish a line of Electric Telegraph within any part of such territories, which license shall be revocable on the breach of any of the conditions therein contained.

Penalties for
establishing or
maintaining unau-
thorised Electric
Telegraphs.

III. Whoever shall otherwise than under a license duly granted as aforesaid establish, or, after revocation of such license, maintain a line of Electric Telegraph within the said territories, shall be liable to a fine not exceeding 1,000 rupees, and for every week during which such line shall be maintained, shall be liable to a further fine not exceeding 500 rupees.

Penalty for using
or working such
telegraphs.

IV. Whoever shall use a line of Electric Telegraph, knowing or having reason to believe that it is an unlicensed line, for the purpose of sending or receiving messages, or shall perform any service incidental thereto, shall for every such offence be liable to a fine not exceeding 50 rupees.

Government may
take possession of
Telegraphs estab-
lished by license.

V. The Governor General of India in Council may, on the occurrence of any public emergency, take temporary possession of any line of Electric Telegraph established under license within the said territories.

Government may
establish Telegraphs
on land of railway
company.

VI. Any railway company, on being required so to do by the Governor General of India in Council, shall permit the Government to establish upon the land of such company adjoining the line of Railway, a line of Electric Telegraph, and shall give every reasonable facility for establishing and using the same.

Governor General
in Council to frame
rules for the conduct
of Government
Telegraphs.

VII. The Governor General of India in Council may from time to time frame rules for the conduct of Electric Telegraphs established by Government, not inconsistent with this Act, and therein prescribe the regulations, conditions, and restrictions according to which all messages and signals shall be transmitted.

Government not
responsible for loss
or damage.

VIII. The Government shall not be responsible for any loss or damage which may occur in consequence of any person employed by the Government in the Electric Telegraph department failing to transmit with accuracy any message entrusted to him for transmission ; and no such person shall be responsible for any such loss or damage, unless he shall cause the same negligently, maliciously, or fraudulently.

IX. Whoever

- IX. Whoever shall, without permission, enter into the signal room of a Government Telegraph office, or shall refuse to quit the same on being requested to do so by any officer or servant employed therein, or shall wilfully obstruct or impede any such officer or servant in the performance of his duty, shall be liable to a fine not exceeding 100 rupees. Penalty for intruding into signal-room, &c.
- X. Whoever shall wilfully cause or attempt to cause any interruption to the transmission of signals along a line of Electric Telegraph established by the Government, by cutting or injuring the wire, or by injuring any portion of the line or posts or any instrument or apparatus, or by any other means, shall be liable to imprisonment, with or without hard labour, for a term not exceeding two years, or to fine, or to both. Penalties for cutting the line.
- XI. Whoever, being in the employ of the Government in the Electric Telegraph department, shall wilfully secrete, make away with, alter, or omit to transmit any message which he may have received for transmission or delivery, or shall wilfully or otherwise than by the official order of a Secretary to the Government of India, or Government of Madras or Bombay, or Lieutenant Governor of Bengal or of the North Western Provinces, or of the Punjab, or Chief Commissioner of Oude, or such other officers as the Governor General of India in Council shall authorize or give such order, divulge any message or the purport of any message or signal to any person not entitled to receive, or to become acquainted with the same, shall be liable to be imprisoned, with or without hard labour, for a term not exceeding two years, or to fine, or to both. Penalties for omitting to transmit or deliver messages or for divulging messages, &c.
- XII. Whoever offers a bribe to any person in the employ of the Government in the Electric Telegraph department in order to induce such person to act in a manner inconsistent with his duty, shall be liable to be imprisoned for a term not exceeding six months, or to fine, or to both. Penalty for offering a bribe.
- XIII. Whoever, being in such employ, shall be guilty of any act of drunkenness, carelessness, or other misconduct, whereby the transmission or delivery of any message shall be endangered, or who shall loiter or make delay in the transmission or delivery of any message, shall be liable to imprisonment, with or without hard labour, for a term not exceeding three months, or to a fine not exceeding 100 rupees, or to both. Penalty for misconduct.
- XIV. Whoever, being in such employ, shall transmit by the Electric Telegraph any message upon which the prescribed charge has not been paid, intending thereby to defraud the Government, shall be liable to be imprisoned, with or without hard labour, for a term not exceeding two years, or to fine, or to both. Penalties for sending messages without payment to Government.
- XV. Whoever shall transmit or cause to be transmitted by an Electric Telegraph established by Government a message which he knows to be false or fabricated, shall be liable to be imprisoned, with or without hard labour, for a term not exceeding two years, or to fine, or to both. Penalties for sending fabricated message.
- XVI. Any person, not being a European British subject, who shall beyond the local limits of the jurisdiction of a court of judicature established by Royal Charter, commit any of the offences mentioned in Sections X., XI., XII., XIII., XIV., and XV. of this Act, shall be punishable upon conviction by any magistrate within whose jurisdiction the offence shall be committed. If any such offence be committed beyond the said local limits by a European British subject, the offender shall be punishable upon conviction before a court of judicature established by Royal Charter. Jurisdiction beyond local limits of supreme court.
- XVII. Any person, whether a European British subject or not, who shall within the local limits of the jurisdiction of a court of judicature established by Royal Charter commit any of the offences referred to in the last preceding section, shall be punishable upon conviction before such court. Jurisdiction within local limits of supreme court.
- XVIII. Any person, whether a European British subject or not, who shall be guilty of any offence, for which, according to the provisions of this Act, he shall be liable to a fine only, shall be punishable for such offence by any magistrate of police for any of the Presidency towns of Calcutta, Madras, and Bombay, or for the Settlement of Prince of Wales' Island, Singapore, and Malacca, magistrate, joint magistrate, or person lawfully exercising the powers of a magistrate, Fines how to be adjudged.

magistrate, within whose jurisdiction the offence shall be committed; and any person hereby made punishable by a magistrate of police shall be punishable upon summary conviction,

Fines how levied.

XIX. All fines imposed under the authority of this Act, for offences punishable by fine only, by any police magistrate, magistrate, joint magistrate, or person lawfully exercising the powers of a magistrate, may, in case of non-payment thereof, be levied by distress and sale of the goods and chattels of the offender, by warrant under the hand of any of the above-named officers, and in case any such fine shall not be forthwith paid, any such officer may order the offender to be apprehended and detained in safe custody until the return can be conveniently made to such warrant of distress, unless such party shall give security to the satisfaction of such officer for his appearance at such place and time as shall be appointed for the return of the warrant of distress, and such officer may take such security by way of recognisance or otherwise; and if, upon the return of such warrant, it shall appear that no sufficient distress can be had whereon to levy such fine, and the same shall not be forthwith paid, or in case it shall appear to the satisfaction of such officer by the confession of the party or otherwise, that he has not sufficient goods and chattels whereupon such fine or sum of money could be levied if a warrant of distress were issued, any such officer, by warrant under his hand, may commit the offender to prison, there to be imprisoned only or to be imprisoned and kept to hard labour, according to the discretion of such officer, for any term not exceeding two calendar months where the amount of the fine shall not exceed 50 rupees, and for any term not exceeding four calendar months where the amount shall not exceed 100 rupees, and for any term not exceeding six calendar months in any other case; the commitment to be determinable in each of the cases aforesaid on payment of the amount.

Imprisonment if no sufficient distress, &c.

Authority to punish Government servants who commit offences against this Act in foreign territory.

XX. If any servant of the Government, employed in the Electric Telegraph Department within the dominions of any foreign Prince or State in alliance with the Government of India in which an Electric Telegraph is established by the Government, shall within the dominions of such Prince or State commit any act hereby prohibited or omit to do any act hereby required to be done by any person similarly employed within the British territories in India, such servant of the Government shall be guilty of an offence, and on conviction thereof shall be punished in the same manner as if such act had been done or omitted within the said last-mentioned territories; and every such person may be tried, convicted, and punished either by fine or otherwise, according to the nature of the offence, by any court or officer duly empowered by the Governor General of India in Council to take cognizance of offences committed in such dominions by servants of the Government, or by any court or magistrate or other competent officer in any part of the British territories in India in the same manner as if the offence had been committed in such part of the said territories.

Explanation of terms.

XXI. The word "Magistrate" in this Act shall include joint magistrates and persons lawfully exercising the powers of Magistrates, and the word "Fine" shall include a penalty or forfeiture.

Government to frame rules for Telegraphs established by license.

XXII. It shall be lawful for the Governor General in Council to frame rules for the conduct of any Electric Telegraph established by license under this Act, and to declare from time to time what portions of this Act shall be applicable to such telegraph and to persons using the same, or employed in connexion therewith. It shall also be lawful for the Governor General in Council to declare from time to time that this Act, or such portions thereof as may be specified, shall be applicable to any Electric Telegraph established or to be established within the British Territories in India by any Foreign Prince or State with the consent of the British Government, and to persons using such Telegraph or employed in connexion therewith.

And to declare Act applicable to Telegraphs established within British territories by Foreign powers.

(NOTE.—*The Correspondence requested is not recorded in this Office. The following is the Resolution of the Government of India authorising the use of the Railway Telegraphs by the Public.*)

EXTRACT from the PROCEEDINGS of the Right Honourable the Governor General of *India* in Council in the Home Department (Electric Telegraph), under date the 6th August 1862.

READ again the undermentioned papers relative to the construction of lines of electric telegraph by railway companies, viz. :—

Licenses (dated 18th of January 1855) granted to the East Indian and Madras Railway Company.

Ditto (dated 5th April 1855) granted to the Great Indian Peninsula Railway Company.

Ditto (dated 6th May 1858) granted to the Sind Railway Company.

Ditto (dated 5th May 1858) granted to the Bombay, Baroda, and Central India Railway Company.

Ditto (dated 20th May 1859) granted to the Eastern Bengal Railway Company.

Ditto (dated 10th December 1859) granted to the Great Southern of India Railway Company.

Ditto (dated 26th April 1860) granted to the Punjab Railway Company.

Ditto (dated 17th May 1861) granted to the Calcutta and South Eastern Railway Company.

RESOLUTION.

THE Governor General in Council has had under consideration the necessity of maintaining the restriction now placed on Railway Companies in India in respect of the conveyance of private telegraph messages on their lines, except where there may be no Government telegraph; and has determined on the withdrawal of the restriction, the Railway Companies being left free to receive and forward private messages irrespective of the existence of Government telegraph lines. The several Railway Companies will, of course, continue to be bound by all other conditions of the respective licenses by which they are permitted to establish lines of Electric Telegraph.

(No. 4001.)

ORDERED that a copy of this resolution be forwarded to the Department of Public Works for information, and for the issue of the needful communications to the several railway companies.

(No. 4002.)

ORDERED also, that a copy be sent to the Director General of Telegraphs in India for information.

STATEMENT of the Entire EXPENDITURE in *England* on Account of ELECTRIC TELEGRAPHS in *India*, viz., on Purchase of Stores, Freights, &c.

	£.	s.	d.
In the year 1864-65	53	8	1
„ „ 1865-66	53,066	—	2
„ „ 1866-67	134,829	11	—
£.	187,948	19	3

W. G. Goodliffe, Accountant General.

(NOTE.—*The Indian expenditure and the receipts from the telegraphs, number of miles open, &c., are given in statements appended to the Report of the Director General of Telegraphs herewith.*)

ADMINISTRATION REPORT OF THE TELEGRAPH DEPARTMENT,
For the Years 1862-63, 63-64, 64-65, 65-66.

From Lieutenant-Colonel *D. G. Robinson*, Director General of Telegraphs in India, to *E. C. Bayley*, Esq., Secretary to Government of India, Home Department.

Sir,

Steamship "Delhi," 22 April 1866.

PRESS of work of greater importance, and the delay in the arrival of data, which had to be called for from the extremities of our Indian empire, compelled me to defer the preparation of the following report on the administration and progress of the Indian Telegraph Department for the years 1862-63, 63-64, 64-65, and 65-66, until after my departure from Calcutta.

Now that I have the time, separation from my head-quarters, the absence of means of reference, and lastly, the constant interruptions of an over-crowded passenger ship, render it impossible that I can make this report either so complete or interesting as the subject requires. Nevertheless, as the work of my leisure hours during the voyage from Calcutta to Suez, I hope that its shortcomings may be forgiven, and the report be accepted as a useful and faithful statement of the progress and prospects of the Indian Telegraph Department.

The tabular statements and detail of operations which took place previous to July 1865, are compilations from the records and reports rendered to my head office. I am not inclined to accept the views expressed as absolutely correct; but I believe they convey the fairest indication procurable of the state of the Department at the period reported; for them I take neither credit nor debit, for, as you are aware, previous to July 1865, I not only had no connection with, but positively knew nothing whatever of the working material, antecedents, or organisation of the Department; I had not, indeed, at the time, the faintest idea of the intentions of the Governor General in Council to honour me with its administration. I trust, therefore, that allowance may be made for these circumstances, and that, in reviewing the manner in which I have executed the trust thus suddenly imposed upon me, I may not altogether have disappointed his Excellency's expectations.

Since July last a very large measure of reform, I may say a total re-organisation of the administrative staff of the department, has been effected. The methods of transacting business and accounts have been greatly simplified; the administration and the executive staff materially strengthened in every respect; heavy arrears of correspondence have been cleared off; the inefficient balance reduced from 19,88,389 rupees to 14,17,405 rupees. The store accounts of 60* lakhs of rupees have been submitted in full; a central office of accounts organised and opened; a staff for the complete examination and comparison of every message entertained and put in motion; and arrangements made for regular schools of instruction. In fact almost every measure recommended in my report, No. 171 A. of 18th October last, and sanctioned on the 30th December last, has been carried out, or so far advanced as to make the completion a matter of routine.

Perhaps the most important of the changes made during the last nine months are the following:—

1st. The introduction of a new tariff based on the same principles that regulate the telegraphs of Europe, which, although higher than that formerly existing, is still very far below the telegraph rates of Europe or America. The financial effects of this change have not yet had time for practical development; but I think it probable that at first there will be a slight falling off. Hereafter, when the former extraordinary cheap rates are forgotten, the receipts will probably nearly equal the expenditure. I believe that the arrangements of quarter groups, which I proposed, would have produced a better revenue and been more convenient to the public. It may yet become a rule of the European telegraphs, when, of course, it will also be adopted in India.

* Which includes 12 lakhs' value of stock in hand.

The new tariff has been accepted and approved of by all the railway companies, except that of the Southern of India, who have made some frivolous objections, which must be over-ruled.

The assimilation of charges has enabled me to recommend an enlargement of the terms of the licenses of all railway telegraphs which are connected with the Government system, which, by affording increased facility for the transmission of messages by more than one line, will prove of great convenience to the public. In exchange for these concessions, all that is asked for is a perfect uniformity in the tariff, code of signalling, description of instruments, and method of counting and working.

2nd. It has been decided by Government to make the introduction of stamps, in lieu of money payments for telegrams, at first only partial and optional. I trust, however, that, as soon as it is practicable, the use of stamps will be made compulsory; for, beyond the difficulty of providing a sufficient number, I see no reason against their being at once thus introduced.

The use of stamps in lieu of money payments, if universal, will very much lighten the labour of the cash checking office, and it is only on account of the practical difficulty of providing the very great number of stamps required for so large a country that led me to agree with Mr. Monteath (the Under Secretary in the Home Department) that their use should at first be limited to service messages only. Further consideration, however, induces me to think that their introduction should be made compulsory on all senders of messages, whether public or private.

The completion of designs for stamps of different values, and the manufacture of those of which the dies already exist, will be one of the duties I shall at once apply myself to after my arrival in England.

3rd. The completion of the organisation of schools for instruction in signalling, elementary education, and construction of lines both for signallers and inspectors, I have had to dedicate to my successor.

4th. My attention has been drawn to the necessity for putting the establishment and lines of the Arracan division into a sound and serviceable state—a matter of no slight importance and difficulty. Major Murray, who has been deputed by me for the inspection of this line, will, on the completion of his tour, submit a report on the nature of the country through which it passes. Of the extraordinary practical difficulties which oppose the efficient working of this line, the world in general appears to be wholly ignorant.

The physical difficulties of the country traversed are so abnormal that positively no other regular means of communication, except by telegraph, exists. For about 120 miles the wire is carried through a dense forest almost entirely denuded of inhabitants, but infested with wild beasts. The malaria is deadly, labour is exceedingly scarce, what there is, is most difficult to procure, numerous creeks abound which can only be crossed by swimming, the climate is so moist and warm that vegetation springs up in a manner almost marvellous, and the growth of plants and creepers is so rapid that after clearance they speedily again reach the wires, and thus form a series of earth conductors, which are most destructive to the maintenance of the electric charge.

5th. The change in the direction of the line from Mogul Serai through Mirzapore to Allahabad, so as to take advantage of the bridges of the East Indian Railway for crossing the Jumna and other large rivers, whereby the cables (elements of weakness) can be dispensed with, will add much to the safety, stability, and means of rapidly restoring communication, and will, I hope, be completed before the ensuing rains.

6th. The change in the direction of the Assam line from Titalyah through Julpigoree to Cooch Behar and Doobree, instead of through Rungpore and Dinapore, will shorten the line 120 miles, and take it through a more accessible country. This cannot possibly be completed before the rains, in consequence of the scarcity of labour and superintendence available.

7th. The careful insulation and duplication of the line between Bombay and Kurrachee is a very important measure. For this, wire and insulators for about 378 miles have arrived, and the remainder will, I expect, reach Bombay before the end of this month; every means available will then be brought to bear to

get both wires into working order, and make this important line safe before the commencement of the monsoon.

8th. A second wire from Agra, *via* Indore to Bombay, and from Agra to Deesa, has lately been recommended; sanction for the former was granted in 1864; for the latter I applied in February last. There does not seem the slightest probability of the proper stores of wire, brackets, and insulators (due last January) arriving for many months. I have, therefore, recommended the use of such wire as can be got—No. 8, and Nos. 3 and 4; and had commenced manufacturing insulators in our own workshops, which, if not equal to those ordered from England, will at any rate be not inferior to the Brooke insulator, and can be fitted to the Brooke bracket, and will be very cheap.

9th. The position of the offices at Allygurb, Bankipore (Patna), and many other stations, is more or less inconvenient. I have directed that the earliest opportunity be seized for rectifying this, and for building or purchasing houses in those stations where an office is sure to be permanently located.

10th. The first volume of the code, which is to define the duties, salaries, responsibilities, and rights of the different officers of the department, was in the press when I left Calcutta. The second or professional volume has not yet been attempted. In minor departmental matters the following are some of the orders likely to be of a useful character:—

1. The encouragement of correspondence by docket for all matters of minor importance.
2. Proof to be given of messages having been delivered to the addressee by attaching the addressee's receipt to the original message, which is now always sent to the check-office for examination.
3. Superintendents authorised and ordered to promote signallers when entitled to it, and to punish them by temporary degradation.
4. Superintendents to take care that telegraph masters do not, to the prejudice of signallers, occupy more rooms in the telegraph office than they are entitled to.
5. Repetition of Indo-European messages.
6. The opening of new offices without sanction strictly prohibited.
7. The punishment for abbreviating words, thus—Cal. for Calcutta, By. for Bombay, pds. for pounds—made very severe.
8. Barrack furniture and rations issued to all offices requiring them.
9. Instructions for medical treatment of epidemics and other diseases peculiar to jungle tracts.

These, and sundry other apparently trifling changes, all tending to make the officers and signallers of the Department feel they are sure of considerate and liberal treatment, have already done an immensity of good. The scarcity of signallers that a year since bid fair to stop work altogether, no longer exists. Many of those officers who had left are anxious to rejoin the department, and the general tone of the department is such as to offer good prospect of future contentment and zealous industry.

The state of the lines, nature of insulation and supports, and distances between offices are shown in Appendix A.

The whole extent of lines and offices have lately been re-divided into 14 circles or divisions, instead of 10. These divisions, each under a superintendent, have been again further divided into four subdivisions, over each of which (lines and offices) an assistant superintendent has been placed in executive charge. The practical results expected are that, whilst the superintendent is left free from all accounts and executive charge, these young officers will take a direct and stronger interest in the working of their subdivisions, and vie with each other in the maintenance of efficiency.

RECOMMENDATIONS.

These may be summed up in a very few lines. The great object to be kept in view is to make Europe your model, keep pace with the age, and to be in advance of the demand. It is not to be expected that the brains of any one man, however clever

clever he may be, can devise a series of inventions superior to the emanations of several men whose whole life is devoted to, and whose prosperity is dependent on, their producing superior articles. I, therefore, advocate a broad principle of striving to obtain those forms of telegraph materials which experience and the opinions of European telegraphic engineers have declared to be the best adapted to the requirements of India; rather than to experiment with the invention of our Indian *savans*. Indeed, I attribute the bad working of the better Indian lines to a deviation from these principles; in other words, to the department being inflicted with the Brooke bracket and insulator, both of which are most thoroughly unfit for the purpose for which they were designed. All stores required from England should be prepared under the superintendence of an officer of the Indian Telegraph Department of known ability. There are always one or more of these officers on leave in England, whom a moderate monthly allowance for performing this duty would readily induce to devote their services. These officers would always know what improvements were being made in telegraphy, which the most improved form or kind of cable or instrument, and would at short intervals bring these improvements to the knowledge of the Director General.

Every line should have double instead of single brackets; the difference is but trifling, and with the double bracket the second wire can be put up, if wanted, with great rapidity.

My other recommendations having all received the approval of Government, I will not repeat them here.

CHECK AND COMPLAINT OFFICE.

From the report by the officer in charge of this office, which is corroborated by the statements appended (Appendix B), it is gratifying to learn that there is considerable improvement in the accuracy as well as speed with which messages are now transmitted; were it otherwise, it may fairly be presumed that the number of complaints would have very materially increased, since complaints are now encouraged, instead of remaining months unanswered; replies are now promptly rendered, and when demanded, every satisfaction is given as far as the rules of the department admit. So far, indeed, from resisting or deprecating complaints, the administration is grateful to any person who supplies information of any kind which may facilitate the detection and correction of faults of commission or omission, or in any way facilitate or improve the efficiency of the department. The administration is, however, no longer dependent on complaints as the sole means of discovering faults in messages; the system of examination and comparison, introduced since the 15th of February last, is now complete, and no error of any nature ought to escape detection and punishment, which, it is hoped, will prevent the speedy recurrence of it.

All the copies of each message are now carefully compared with the original message, forwarded and signed by the sender; errors, therefore, are at once detected, and the parties in fault punished, not formally by fixed fines, which press unequally, but by per-centage fines on monthly salaries. This punishment, moreover, is no longer applied to the signaller in fault only; the *pro tem.* responsible head of the office shares in it as is only fair. It could not, however, be applied formerly, because so long as the telegraph master was alone in the management of the office, it was practically impossible to fix on him responsibility for faults which might have been committed during the time he was eating or sleeping. Now a telegraph master need be only eight hours out of the twenty-four on duty, as he has one or two deputies according to the work of the office, and consequently there can be no excuse for laxity, carelessness, or any irregularities on the part of the signallers. But as no system of punishments will obtain honest willing work unless there be rewards also for the well deserving, Appendix C shows the terms of encouragement which are given for continuous steady conduct.

A system of tests has been established (Appendix D) by which to regulate the grade of every member of the signal branch biennially; and, further, the Government have very liberally allowed all fines to be applied to the purchase of books for the office libraries of the department. Thus, strong inducement is held out to every man to conduct himself well, and every man, however unsteady he may have been, can be sure of bettering his position or salary whenever he shall better his conduct.

Lastly, to prevent loss of messages, to facilitate their examination, and to prevent errors in number, a system of registration of stamping and signalling (*vide* Appendix E), is just now coming into force, which will, I believe, fully effect the object sought.

As regards the actual cash checking, this, too, instead of getting more and more into arrears, is now regularly kept up to date. The improvement is due partly to improved system, but mainly to the good and energetic management of Mr. McKelvey, the Assistant Superintendent in charge. When stamps are introduced and made compulsory on all messages, the duties of this branch will, of course, almost wholly cease.

I trust that this measure will not be long delayed. I admit the practical difficulty of supplying the enormous number that will be required to meet the wants of all India, and on that account, yielded assent—a rather reluctant one—to the Under Secretary's, in the Home Department, proposition, to make their experimental introduction optional, instead of compulsory. I am sorry I did so now, because, should the experiment fail, the failure will probably influence the compulsory introduction hereafter. I have no doubt of their being a convenience to a large proportion of the public; but I am not so sanguine of telegraph and other officials of Government giving it their thorough co-operation unless they are obliged so to do.

INTERRUPTIONS.

The number of interruptions is shown in the (Appendix F). It is evidently not possible to preserve lines of such enormous extent as those of India from occasional interruptions. In the wild forest tracts, such as those of Assam, Arracan, Ceylon, or the south of India, trees will fall and grass and creepers will grow in spite of the utmost care. Wild elephants will occasionally cross the lines and knock down the posts; whilst no part of India is exempt from the violence of tropical thunderstorms and gales, all of which are sources of interruption to telegraphic communication.

But the hopelessness of wholly avoiding interruptions and imperfect communication makes it all the more imperative that there be efficient means for restoring communication with the least practicable delay. I have, therefore, recommended the erection of rest-houses in inhospitable tracts, camel riders for the sandy deserts of Rajpootana and Sind, and sundry other minor measures, all tending to reduce their duration.

Imperfect communication is another evil to which all telegraph lines are liable, and with which the Department will have to contend at great disadvantage for some time longer. Cases of this nature are partly due to bad insulation and wire, and partly to the growth of vegetation in the immediate proximity of the line. To remedy the first, within the next six weeks, enough wire and insulators may be expected to reach India to place Bombay, Kurrachee, and Agra in good electric communication before the ensuing rainy season sets in; but there will not be enough for the other lines landed in India until late in the year. Should they reach in October or November next, the remaining main lines of India ought also to be put into a really good state of insulation before the following monsoon. That all cannot be done this year is greatly to be lamented, and would not be the case had Captain Mallock been permitted to remain in England three months longer to superintend and accelerate the manufacture and dispatch of the stores.

I hope the returns of every year will show fewer interruptions and fewer imperfect communications, and the duration of them shorter; but the Indian public or any other public must be reasonable and not expect perfection.

The Indian department will do well, if, in the face of the difficulties which operate on all works for distance from the source of supply and invention, it even approximates to the perfection that exists in England, the circumstances of the two countries being altogether so different.

In England the lines are generally erected by the side of the railways with offices at short intervals; the length of the interrupted portion must, therefore, always be short, whilst the facilities for travelling along the line are very great. In India, whilst the intervals between stations are ten times greater, the facilities for travelling rapidly from one to another are comparatively three or four times less

less. Let allowances for these differences be granted, and I am quite confident that the Indian lines, when insulated and doubled, will work as well as any lines in the world, perhaps better.

I have, &c.
(signed) *D. G. Robinson*, Lieut-Col., R.E.,
Director General of Telegraphs in India.

STATEMENT 1.

LINES.

1862-63.	Miles.	Miles.	Miles.
Total Length of Lines open on the 30th April 1862, or at the close of the official year 1861-62.	-	-	11,071*
During the year 1862-63 the following new lines were constructed, viz. :—			
<i>Central India Circle.</i>			
From Chinoor to Sironcha - - - - -	-	12½	
<i>Pegu Circle.</i>			
Between Shoaygheen and Moulmein - - - - -	-	130	
<i>Punjab Circle.</i>			
From Meerut to Roorkee - - - - -	64†		
„ Roorkee to Mussoorie - - - - -	56		
„ Roorkee to Hurdwar - - - - -	16½		
		136½	279
Total Length of Lines open on the 30th April 1863 - - -			11,350
1863-64.			
During this year the following new lines were constructed, or opened for communication, viz. :—			
<i>Bengal Circle.</i>			
From Sahibgunge to Purneah - - - - -	50½		
„ Purneah to Titalya - - - - -	72		
„ Titalya to Darjeeling - - - - -	62	184½	
<i>Bombay Circle.</i>			
From Goa to Margao - - - - -	16½		
„ Margao to Seedasheeghur - - - - -	37½	53½	
<i>East Coast Circle.</i>			
From Coconada to Neelapillay - - - - -	-	12	
<i>Indore Circle.</i>			
From Agra to Bhurtpore - - - - -	34		
„ Bhurtpore to Jeypore - - - - -	111½		
„ Indore to Rutlam - - - - -	88½	234½	
Carried forward - - -		484½	11,350

* This includes 41 miles of line short calculated in the Punjab Circle in the previous Annual Report.

† This section of the line was completed last year, but not opened for communication till the following year.

1863-64—continued.		Miles.	Miles.	Miles.
Punjab Circle.		Brought forward - - -	484 $\frac{3}{8}$	11,350
From Lahore to Mean Meer - - - - -		- - -	6	
Pegu Circle.				
Additional length of the new lines constructed by the new route <i>via</i> Henzada and Padoung.		- - -	18 $\frac{1}{2}$	
			508 $\frac{7}{8}$	
The following line has been dismantled during the year, and its materials distributed along the Baroda Railway for the construction of the new line from Bombay to Bulsar, viz.:—				
Bombay Circle.				
From Bulsar to Nassick - - - - -		- - -	75	
				483 $\frac{7}{8}$
Total Length of Lines open on the 30th April 1864 - - -				11,783 $\frac{7}{8}$
1864-65.				
The following new lines were constructed, or opened for communication, during this year, viz.:—				
Bengal Circle.				
From Titalya to Bugwah - - - - -		150		
„ Bugwah to Gowhatty - - - - -		163		
			313	
Bombay Circle.				
From Ajmere to Deesa - - - - -		250		
„ Bombay to Bulsar - - - - -		128		
„ Seedasheeghur to Coondapore - - - - -		120		
			498	
Central India Circle.				
From Sironcha to Damagodium - - - - -		- - -	120	
Dacca Circle.				
From Akyab to Dalet River - - - - -		- - -	148	
Indore Circle.				
From Jeypore to Ajmere - - - - -		85		
„ Ajmere to Nusseerabad - - - - -		13		
			98	
Madras Circle.				
From Mercara to Mangalore and Coondapore - - -		145		
„ Tuticorin to Palamcottah - - - - -		30		
„ Palamcottah to Nagercoil - - - - -		43 $\frac{1}{2}$		
Between Cochin and Trevandrum, distance 124 miles, completed.		97		
			315 $\frac{1}{2}$	
Pegu Circle.				
From Tounghoop to Dalet River - - - - -		- - -	96	
The following lines were dismantled during the year:—				
Bengal Circle.				
From Teen Pahar Junction on the Railway to Rajmahal - -		7		
Carried forward - - -		7	1,588 $\frac{1}{2}$	11,783 $\frac{7}{8}$

LINES—1864-65—continued.		Miles.	Miles.	Miles.
Brought forward - - -		7	1,588½	11,783½
<i>East Coast Circle.</i>				
From Balasore to Kedgerce - - - - -		96	103	1,485½
Total Length of Lines open on the 30th April 1865 - - -				13,269½
1865-66.				
During this year the following new Lines were constructed or opened for communication, viz.:—				
<i>Assam Division.</i>				
From Gowhatty to Cherrapoonjee and Cachar - - - - -		-	198	
<i>Indore Division.</i>				
From Rutlam to Neemuch - - - - -		-	86	
<i>Malabar Coast Division.</i>				
Between Trevandrum and Cochin - - - - -		-	34	
<i>Bengal Division.</i>				
From Agra to Muttrah - - - - -		-	31½	
The following Lines were dismantled during the year:—			349½	
<i>Bengal Division.</i>				
From Kedgerce to Kookrohatty - - - - -		28		
„ Kookrohatty to Midnapore - - - - -		63		
<i>Pegu Division.</i>				
From Akyab to Padeng - - - - -		138	229	120½
Total Length of Lines open on the 30th April 1866 - - -				13,390½

OFFICES.

1862-63.			
Total number of Offices open on the 30th April 1862, or at the close of the official year 1861-62.	-	-	144
The following new Offices were opened during the year 1862-63, viz.:—			
<i>Bombay Circle.</i>			
Swantwaree - - - - -	1		
<i>Central India Circle.</i>			
Sironcha - - - - -	1		
Carried forward - - -	2	-	144

OFFICE3—1862-63—continued.			
Brought forward - - -	2	- -	144
<i>Indore Circle.</i>			
Khull - - - - -	1		
<i>Madras Circle.</i>			
Tellichery and Vypean - - - - -	2		
<i>Pegu Circle.</i>			
Moulmein, Myanoung, Padoung, and Sittang - - -	4		
<i>Punjab Circle.</i>			
Hurdwar and Mussoorie - - - - -	2	11	
The following Offices were permanently closed during the year 1862-63, viz. :—			
<i>Bengal Circle.</i>			
Dehree - - - - -	1		
<i>Bombay Circle.</i>			
Gudduck - - - - -	1		
<i>Central India Circle.</i>			
Chinnoor - - - - -	1		
<i>Dacca Circle.</i>			
Kyook Phyoo - - - - -	1		
<i>Indore Circle.</i>			
Ackberpore - - - - -	1		
<i>Madras Circle.</i>			
Guindy - - - - -	1		
<i>Pegu Circle.</i>			
Menghee, Padeng, and Pegu - - - - -	3	9	2
Total Number of Offices remaining open on the 30th April 1863 - - -			146
1863-64,			
During this year the following new Offices were opened, viz. :—			
<i>Bengal Circle.</i>			
Darjeeling, Peerpointee, Purneah, and Titalya - - -	4		
<i>Bombay Circle.</i>			
Seedasheeghur - - - - -	1		
<i>East Coast Circle.</i>			
Neelapilly - - - - -	1		
<i>Indore Circle.</i>			
Blurtpore, Jeypore, Mhow, and Rutlam - - - - -	4		
<i>Madras Circle.</i>			
Beypore and Cuddalōre - - - - -	2	12	
Carried forward - - -			140

OFFICES—1863-64— <i>continued</i> .			
Brought forward - - -	-	12	146
The following Offices were permanently closed during the year:—			
<i>Bengal Circle.</i>			
Bhangulpore and Rajmahal - - - - -	2		
<i>Madras Circle.</i>			
Vypean - - - - -	1		
		3	9

Total Number of Offices remaining open on the 30th April 1864 - - - 155

1864-65.			
The following new Offices were opened during this year, viz.:—			
<i>Bengal Circle.</i>			
Bugwah, Gowhaty, Dinagepore, Rungpore, Gwalparah, and Sahibgunge	6		
<i>Bombay Circle.</i>			
Beawur, Erinpoorah, and Margao - - - - -	3		
<i>Central India Circle.</i>			
Damagodium and Enchampilay - - - - -	2		
<i>Indore Circle.</i>			
Ajmere and Nusseerabad - - - - -	2		
<i>Madras Circle.</i>			
Allepi, Mangalore, Nagercoil, Palamcottah, Quilon, and Trevandrum	6		
<i>Pegu Circle.</i>			
Aeng, Padoung, and Tonghoop - - - - -	3		
		22	
The following Offices were closed during the year, viz.:—			
<i>Bengal Circle.</i>			
Kookrohatty and Peerpointee - - - - -	2		
<i>Central India Circle.</i>			
Rewah - - - - -	1		
		3	19

Total Number of Offices remaining open on the 30th April 1865 - - - 174

1865-66.			
The following new Offices were opened during the year, viz.:—			
<i>Assam Division.</i>			
Cherrapoonjee, Cooch Behar, and Doobree - - -	3		
<i>Bengal Division.</i>			
Muttrah - - - - -	1		
Carried forward - - -	4		174

OFFICES--1865-66--continued.			
Brought forward - - -		4	174
<i>Dacca Division.</i>			
Pabroo - - - - -		1	
<i>Indore Division.</i>			
Neemuch - - - - -		1	
During this year the following Offices were closed, viz. :-			6
<i>Assam Division.</i>			
Bugwah and Dinagepore - - - - -		2	
<i>Bengal Division.</i>			
Kedgerree - - - - -		1	
<i>Bombay Division.</i>			
Bulsar - - - - -		1	
<i>Dacca Division.</i>			
Furreedpore - - - - -		1	
<i>Nagpore Division.</i>			
Enchampillay - - - - -		1	
<i>Rajpootana Division.</i>			
Beawur and Bhurtpore - - - - -		2	
			8
			2
Total Number of Offices remaining open on the 30th April 1866 - - -			172

STATEMENT 2.

Length of Single, Double, Treble, Quadruple, and Quintuple Lines in the Department on the 30th April 1866.

DIVISIONS.	Single Lines.	Double Lines.	Treble Lines.	Quadruple Lines.	Quintuple Lines.	TOTAL.
	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>
Bengal - - - - -	1,061	464½	13½	67	4	1,610
Bombay - - - - -	556	454	5	-	-	1,015
Madras - - - - -	847½	4	½	-	-	852
Punjab - - - - -	1,311	-	-	-	-	1,311
Indore - - - - -	770	18	-	-	-	788
Rajpootana - - - - -	485½	321½	-	-	-	807
Bangalore - - - - -	1,051	8	-	-	-	1,059
Malabar Coast - - - - -	984½	6½	-	-	-	991
Ganjam - - - - -	866	-	-	-	-	866
Nagpore - - - - -	925½	12½	-	-	-	938
Scinde - - - - -	981	4½	½	-	-	986
Dacca - - - - -	669	-	-	-	-	669
Pegu - - - - -	761	10	-	-	-	771
Assam - - - - -	727	-	-	-	-	727
TOTAL - - - - -	11,996	1,303½	19½	67	4	13,390

STATEMENT 3.

CLASSIFIED LIST of OFFICES under the Indian Government, for the Year 1862-63.

NAMES OF OFFICES.	In what Circle.	Whether Departmental or Private Building, and Free or Rented.	Monthly Rent.	REMARKS.
			<i>Rs. a. p.</i>	
1 Agra - -	Bengal - -	Government property	—	
Ahmedabad -	Bombay - -	Rented - - -	40 - -	
Ahmednuggur -	- ditto - -	- ditto - - -	50 - -	
Akyab - -	Decca - -	Government property	—	
Allahabad -	Bengal - -	Rented - - -	125 - -	
Allyghur -	Punjaub - -	- ditto - - -	50 - -	
Atcheepore -	Bengal - -	- ditto - - -	40 - -	
Attock - -	Punjaub - -	Government property	—	
Balasore - -	East Coast - -	- ditto - - -	—	
10 Bangalore -	Madras - -	Rented - - -	110 - -	
Bareilly - -	Punjaub - -	- ditto - - -	60 - -	
Baroda - -	Bombay - -	- ditto - - -	50 - -	
Barrackpore -	Bengal - -	- ditto - - -	55 - -	
Belgaum - -	Bombay - -	- ditto - - -	50 - -	
Bellary - -	Madras - -	- ditto - - -	50 - -	
Benares - -	Bengal - -	- ditto - - -	50 - -	
Beora - -	Indore - -	Government property	—	
Berhampore -	East Coast - -	Rented - - -	50 - -	
Bezwarrah - -	- ditto - -	Government property	—	
20 Bhaugulpore -	Bengal - -	Rented - - -	45 - -	Closed in 1863-64.
Bimlipatam -	East Coast - -	- ditto - - -	25 - -	
Bombay - -	Bombay - -	- ditto - - -	450 - -	
Broach - -	- ditto - -	- ditto - - -	30 - -	
Buddeena - -	Scinde - -	Government property	—	
Bulsar - -	Bombay - -	Rented - - -	30 - -	Closed in 1865-66.
Burdwan - -	Bengal - -	- ditto - - -	55 - -	
Burhee - -	- ditto - -	Government property	—	
Calcutta - -	- ditto - -	Rented - - -	500 - -	
Calicut - -	Madras - -	- ditto - - -	45 - -	
30 Calingapatam -	East Coast - -	- ditto - - -	15 - -	
Cannanore - -	Madras - -	- ditto - - -	50 - -	
Cawnpore - -	Bengal - -	Government property	—	
Chanda - -	Central India -	Rented - - -	15 - -	
Chicacole - -	East Coast - -	- ditto - - -	20 - -	
Chittagong - -	Dacca - -	- ditto - - -	100 - -	
Cochin - -	Madras - -	- ditto - - -	30 - -	
Coconada - -	East Coast - -	- ditto - - -	40 - -	
Commillah - -	Dacca - -	- ditto - - -	20 - -	
Cuttack - -	East Coast - -	- ditto - - -	120 - -	
40 Dacca - -	Dacca - -	- ditto - - -	180 - -	
Dapoorree - -	Bombay - -	Government property	—	
Deesa - -	- ditto - -	Rented - - -	35 - -	
Delhi - -	Punjaub - -	- ditto - - -	60 - -	
Dera-Gazee-Khan.	- ditto - -	Government property	—	
Dera-Ismail-Khan.	- ditto - -	Rented - - -	20 - -	
Dharwar - -	Bombay - -	Government property	—	

NAMES OF OFFICES.	In what Circle.	Whether Departmental or Private Building, and Free or Rented.	Monthly Rent.	REMARKS.
			<i>Rs. a. p.</i>	
Dhooliah -	Indore -	Rented -	30 - -	
Diamond Har- bour.	Bengal -	Government property	—	
Dowlaishwaram	East Coast -	Rented -	60 - -	
50 Furreedpore -	Dacca -	Government property	—	Closed in 1865-66.
Futteyghur -	Bengal -	ditto -	—	
Fyzabad -	ditto -	ditto -	—	
Goa -	Bombay -	Rented -	25 - -	
Gwalior -	Indore -	Government property	—	
Henzada -	Pegu -	ditto -	—	
Hooghly Point	Bengal -	ditto -	—	
Hurdwar -	Punjaub -	ditto -	—	
Hyderabad (Deccan).	Central India -	Rented -	140 - -	
Hyderabad (Scinde).	Scinde -	ditto -	50 - -	
60 Indore -	Indore -	ditto -	95 - -	
Jacobabad -	Scinde -	Government property	—	
Jessore -	Dacca -	Rented -	30 - -	
Jubbulpore -	Central India -	Government property	—	
Jullundur -	Punjaub -	Rented -	35 - -	
Karical -	Madras -	ditto -	15 - -	
Keamaree -	Scinde -	Government property	—	
Kedgeree -	Bengal -	ditto -	—	Closed in 1865-66
Khull -	Indore -	ditto -	—	
Kolapore -	Bombay -	ditto -	—	Closed in 1864-65.
70 Kookrahatty -	Bengal -	ditto -	—	
Kotree -	Scinde -	Rented -	40 - -	
Kurnool -	Central India -	ditto -	70 - -	
Kurrachee -	Scinde -	Rented -	90 - -	
Kusmore -	Ditto -	Government property	—	
Lahore -	Punjaub -	ditto -	—	
Lucknow -	Bengal -	Rented -	60 - -	
Madras -	Madras -	ditto -	210 - -	
Mahableshwar -	Bombay -	Government property	—	
Malabar Point -	ditto -	ditto -	—	
80 Malligaum -	Indore -	ditto -	—	
Masulipatam -	East Coast -	Rented -	20 - -	
Matheran -	Bombay -	Government property	—	
Meerut -	Punjaub -	ditto -	—	
Mercara -	Madras -	Rented -	30 - -	
Midnapore -	East Coast -	Government property	—	
Mirzapore -	Central India -	ditto -	—	
Mooltan -	Punjaub -	Rented -	60 - -	
Moradabad -	Ditto -	ditto -	35 - -	
Moulmein -	Pegu -	ditto -	50 - -	
90 Mount St. } Thomas }	Madras -	ditto -	25 - -	
Mud Point -	Bengal -	Government property	—	
Murree -	Punjaub -	ditto -	—	
Mussoorie -	Ditto -	Rented -	81 4 -	
Myanong -	Pegu -	Government property	—	
Mysore -	Madras -	Free -	—	

NAMES OF OFFICES.	In what Circle.	Whether Departmental or Private Building, and Free or Rented.	Monthly Rent.	REMARKS.
			<i>Rs. a. p.</i>	
Nagpore - -	Central India - -	Government property	—	
Nassick - -	Indore - -	Rented - - -	30 - -	
Negapatam - -	Madras - -	- ditto - - -	60 - -	
Nellore - -	East Coast - -	- ditto - - -	45 - -	
100 Nuggur Parkur	Scinde - -	Government property	—	
Nyneer Tal - -	Punjaub - -	Rented - - -	100 - -	
Ongole - -	East Coast - -	Government property	—	
Ootacamund - -	Madras - -	Rented - - -	60 - -	
Padoung- - -	Pegu - -	Government property	—	
Parell - -	Bombay - -	- ditto - - -	—	
Patna - -	Bengal - -	Rented - - -	50 - -	
Paumben - -	Madras - -	Government property	—	
Peshawur - -	Punjaub - -	- ditto - - -	—	
110 Pondicherry - -	Madras - -	Rented - - -	45 - -	
Poonah - -	Bombay - -	- ditto - - -	80 - -	
Prome - -	Pegu - -	Government property	—	
Puttoocottah - -	Madras - -	- ditto - - -	—	
Rajmahal - -	Bengal - -	Rented - - -	40 - -	Closed in 1863-64.
Rajunpore - -	Punjaub - -	Government property	—	
Ramoo - -	Dacca - -	- ditto - - -	—	
Raneegunge - -	Bengal - -	- ditto - - -	—	
Rangoon - -	Pegu - -	Rented - - -	80 - -	
Rawul Pindee - -	Punjaub - -	Government property	—	
120 Rewah - -	Central India - -	Rented - - -	20 - -	Closed in 1864-65.
Roorkee - -	Punjaub - -	Government property	—	
Saugor - -	Bengal - -	- ditto - - -	—	
Sattara - -	Bombay - -	Rented - - -	40 - -	
Sawuntwarree - -	- ditto - -	Government property	—	
Seepree - -	Indore - -	- ditto - - -	—	
Seonee - -	Central India - -	Rented - - -	40 - -	
Shajehanpore - -	Punjaub - -	Government property	—	
Shikarpoor - -	Scinde - -	- ditto - - -	—	
Shoaygheen - -	Pegu - -	- ditto - - -	—	
180 Sinla - -	Punjaub - -	Rented - - -	66 10 8	
Sironcha - -	Central India - -	Government property	—	
Sittang - -	Pegu - -	- ditto - - -	—	
Sukkur - -	Scinde - -	Rented - - -	15 - -	
Surat - -	Bombay - -	- ditto - - -	80 - -	
Taroosha - -	Scinde - -	Government property	—	
Tellicherry - -	Madras - -	Rented - - -	30 - -	
Thyetmyoo - -	Pegu - -	Government property	—	
Toungbo - -	- ditto - -	- ditto - - -	—	
Tuticorin - -	Madras - -	Rented - - -	25 - -	
Umballah - -	Punjaub - -	- ditto - - -	70 - -	
140 Umritsur - -	- ditto - -	- ditto - - -	30 - -	
Vellore - -	Madras - -	- ditto - - -	17 - -	
Vingorla - -	Bombay - -	- ditto - - -	10 - -	
Vizagapatam - -	East Coast - -	- ditto - - -	110 - -	
Vizianagram - -	- ditto - -	- ditto - - -	21 - -	
Vypean - -	Madras - -	- ditto - - -	(not known)	Closed in 1863-64.
146 Warrungul - -	Central India - -	- ditto - - -	10 - -	

NEW OFFICES opened during the Year 1863-64, and remaining open on the 30th April 1864.

NAMES OF OFFICES.	In what Circle.	Whether Departmental or Private Building, and whether Free or Rented.	Monthly Rent.	REMARKS.
1 Beypore -	Madras -	Rented - - -	Rs. a. p. 25 - -	Closed in 1865-66.
Bhurtapore -	Indore -	Government property	- - -	
Cuddalore -	Madras -	- ditto.	- - -	
Darjeeling -	Bengal -	Rented - - -	40 - -	
Jeypore -	Indore -	Government property.	- - -	
Mhow -	- ditto -	- ditto.	- - -	Closed in 1864-65.
Neelapilly -	East Coast Circle	Rented - - -	20 - -	
Peerpointee -	Bengal -	- ditto - - -	40 - -	
Purneah -	- ditto -	- ditto - - -	100 - -	
10 Rutlam -	Indore -	Government property.	- - -	
Shedashghur -	Bombay -	Rented - - -	15 - -	
12 Titalya -	Bengal -	Government property.	- - -	

NEW OFFICES opened during the Year 1864-65, and remaining open on the 30th April 1865.

			Rs. a. p.	
1 Aeng -	Pegu.			
Ajmere -	Indore -	Rented - - -	85 - -	
Allepi -	Madras -	- ditto - - -	30 - -	
Beawur -	Bombay -	- ditto - - -	60 - -	Closed in 1865-66.
Bugwah -	Bengal -	Government property	- - -	- ditto.
Damagodium -	Central India -	- ditto.	- - -	
Dinagapore -	Bengal -	Rented - - -	35 - -	- ditto.
Erinpoorah -	Bombay -	- ditto - - -	12 - -	
Enchampilly -	Central India -	Government property.	- - -	- ditto.
10 Goalparah -	Bengal -	- ditto.	- - -	
Gowhaity -	- ditto -	- ditto.	- - -	
Mangalore -	Madras -	Rented - - -	20 - -	
Margao -	Bombay -	Free.	- - -	
Nagercoil -	- ditto -	Rented - - -	15 - -	
Nusseerabad -	Indore -	- ditto - - -	50 - -	
Padoung -	Pegu.			
Palamcottah -	Madras,			
Quilon -	- ditto -	Rented - - -	25 - -	
Rungpore -	Bengal -	- ditto - - -	50 - -	
20 Sahibgunge -	- ditto -	Government property.	- - -	
Trevandrum -	Madras -	Rented - - -	30 - -	
22 Tonghoop -	Pegu.			

NEW OFFICES opened during the Year 1865-66, and remaining open on the 30th April 1866.

			Rs. a. p.	
1 Cherrapoonjee	Assam -	Rented - - -	50 - -	
Cooch Behar -	- ditto -	- ditto - - -	30 - -	
Doobree -	- ditto -	Government property.	- - -	
Muttra -	Bengal -	Rented - - -	20 - -	
Neemuch -	Indore -	- ditto - - -	40 - -	
6 Pabroo -	Decca -	Government property.	- - -	

STATEMENT 4.

STATEMENT of the Number of Miles of Government Telegraph Lines and Stations open in each Year during the Official Years 1862-63, 63-64, 64-65, and 65-66.

OFFICIAL YEAR.	1. Bengal.		2. Bombay.		3. Madras.		4. Punjab.		5. Central India, or Nagpore.		6. Pegu.		7. Dacca.	
	Number of Miles.	Number of Offices.	Number of Miles.	Number of Offices.	Number of Miles.	Number of Offices.	Number of Miles.	Number of Offices.	Number of Miles.	Number of Offices.	Number of Miles.	Number of Offices.	Number of Miles.	Number of Offices.
1862-63 - -	1,749	22	1,238	20	1,345½	20	1,811½	23	1,331¾	10	668	10	500	7
1863-64 - -	1,933½	24	1,216¾	20	1,345½	21	*1,744½	23	1,331¾	10	686½	10	500	7
1864-65 - -	2,239½	28	1,714¾	23	1,661	27	1,744½	23	1,451¾	11	782½	13	648	7
1865-66 - -	1,610	21	1,015	15	852	12	1,311	20	938	8	771	12	669	7

OFFICIAL YEAR.	8. Indore.		9. East Coast, or Ganjam.		10. Scinde.		11. Raj- pootana.		12. Malabar Coast.		13. Bangalore.		14. Assam.		15. TOTAL.	
	Number of Miles.	Number of Offices.	Number of Miles.	Number of Offices.	Number of Miles.	Number of Offices.	Number of Miles.	Number of Offices.	Number of Miles.	Number of Offices.	Number of Miles.	Number of Offices.	Number of Miles.	Number of Offices.	Number of Miles.	Number of Offices.
1862-63 - -	735	8	1,186½	15	784¾	11	-	-	-	-	-	-	-	-	11,350	146
1863-64 - -	969½	12	1,198½	16	857¾	12	-	-	-	-	-	-	-	-	11,783½	155
1864-65 - -	1,067½	14	1,102½	16	857¾	12	-	-	-	-	-	-	-	-	13,269½	174
1865-66 - -	788	11	866	12	986	13	807	7	991	18	1,059	7	727	9	13,390	172

* During the year 1863-64, 73 miles of the line between Kusmore and Rajunpore were transferred from the Punjab to the Scinde Circle.

STATEMENT 5.

The Strength of the Establishment at the beginning and end of the Years 1862-63, 1863-64, 1864-65, and 1865-66, was, exclusive of Office Servants and others drawing less than 10 rupees per mensem, as follows :

G R A D E.	Strength on the 30th April 1862.	Strength on the 30th April 1863.	Strength on the 30th April 1864.	Strength on the 30th April 1865.	Strength on the 30th April 1866.
Director General - - -	1	1	1	1	1
Deputy Director General - - -	- -	- -	- -	- -	1
Director of Divisions - - -	3	3	3	3	—
Superintendents - - -	15	15	15	14	18
Assistant Superintendents - - -	10	10	12	13	71
Sub-Assistants - - -	- -	- -	- -	- -	4
First Inspectors - - -	20	18	15	14	12
Second ditto - - -	24	24	26	26	26
Third ditto - - -	19	23	24	24	—
Fourth ditto - - -	18	14	8	—	—
Overseers :					
Europeans - - -	- -	- -	- -	43	—
Natives - - -	- -	- -	- -	23	22
Sub-Inspectors - - -	—	—	—	—	—
Assistants in Charge or Telegraph Masters and Signallers :					
Europeans - - -	534	523	574	668	747
Natives - - -	92	71	71	101	107
Probationers :					
Europeans - - -	72	82	91	68	28
Natives - - -	10	17	12	16	7
Line Artificers - - -	44	61	68	2	—
Mounted Artificers or Line Riders, Patrols or Line Runners, Mac- cudums, Jamadars, Lascars, and other Line Establishments -	157	127	143	116	146
Compiler or Deputy Controller of Telegraph Accounts - -	1	1	1	- -	1
Head Clerks and Accountants -	13	18	16	16	12
Clerks, Assistant Accountants, Record Keepers, &c. - -	143	145	139	132	175
Superintendent of Printing Office, Compositors, Pressmen, Litho- graphers, &c. - - -	16	16	16	20	14

STATEMENT 6.

STATEMENT showing the Expenses incurred in the Construction of (Government) Telegraph Lines in India during the Years 1862-63, 1863-64, 1864-65, and 1865-66.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
	General	BENGAL.	BOMBAY.	MADRAS AND SOUTH EAST COAST.	PUNJAB.	CENTRAL INDIA OR NAGPORE.	PEGU.	DACCA.	INDORE.
GENERAL SUPERINTENDENCE AND SCHOOL.		Total Expenditure, exclusive of Cost of Europe Stores.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
- -	(a) 4,126 10 6	69,860 11 8	- - -	96 4 -	25,889 8 8	43,790 4 9	34,469 15 6	6,817 15 6	8,554 9 4
- -	(a) 6,478 13 3	1,14,090 8 1	25,456 11 10	46,616 - 10	58,669 7 11	702 13 -	85,032 12 3	8,274 14 3	87,067 12 -
- -	- - -	2,91,235 9 -	74,420 13 -	15,336 2 7	61,769 11 7	51,429 - 9	3,596 15 9	32,224 14 9	38,579 8 6
- -	31,045 5 3	19,133 15 1	50,819 10 11	12,989 1 -	18,729 11 6	13,403 5 6	36,089 13 3	7,021 11 8	13,894 13 4

	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.
	EAST COAST OR GANJAM.	SCINDR.	RAJ- POOTANA.	MALABAR COAST.	BANGA- LORE.	ASSAM.	WORKSHOP AND STORE DEPARTMENT.	TOTAL.	Value	Total
GENERAL SUPERINTENDENCE AND SCHOOL.	Total Expenditure, exclusive of Cost of Europe Stores.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.	Ditto.	of Europe Stores Expended.	Expenditure, including Europe Stores.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. u. p.	Rs. a. p.
- -	9,745 3 8	655 9 4	- (b) -	- (b) -	- (b) -	- (b) -	1,80,487 5 8	3,84,494 2 7	10,04,097 - -	13,88,591 2 7
- -	2,600 5 6	2,227 11 9	- - -	- - -	- - -	- - -	2,37,294 15 -	6,74,512 15 8	19,68,376 - -	26,42,888 15 8
- -	4,509 15 10	25,927 9 9	- - -	- - -	- - -	- - -	5,35,076 2 10	11,34,106 8 4	4,43,837 2 2	15,77,943 10 6
- -	1,861 13 7	3,949 8 8	2,103 10 2	5,169 2 8	9,222 1 -	- - -	2,55,236 6 7	4,80,675 2 2	4,17,319 14 -	8,97,995 - 2

(a) Charges incurred on Account School of Signallers.

(b) These Divisions were formed in January 1866.

STATEMENT 7.

STATEMENT of Receipts by Sale of Unserviceable Stores on Account Construction of the Government Telegraph Lines, for the Years 1862-63, 1863-64, 1864-65, and 1865-66.

	Rs. a. p.	
1862-63 - - - -	2,101 12 7	
1863-64 - - - -	* 26,694 6 7	* This amount includes Rs. 16,487. 9. 6. for value of Europe and Country Stores supplied to the East Indian Railway Company.
1864-65 - - - -	17,485 13 1	
1865-66 - - - -	6,916 3 3	

STATEMENT 8.

STATEMENT showing the Receipts on Account of Private Service, Departmental or Telegraph Serv

OFFICIAL YEAR.	B E N G A L.						B O M B A Y.	
	Cash Receipts on Account Private Messages.	Cash Receipts on Account Service Messages.	Cash Receipts on Account Telegraph Service Messages.	Receipts by Fines.	Receipts by Sale of Unserviceable Stores.	TOTAL.	Cash Receipts on Account Private Messages.	Cash Rec on Account S Messag
1862-63 - - -	Rs. a. p. 1,78,230 11 3	Rs. a. p. 27,897 6 -	Rs. a. p. 1,234 12 -	Rs. a. p. 1,472 14 9	Rs. a. p. - - -	Rs. a. p. 2,08,835 12 -	Rs. a. p. 2,00,756 4 9	Rs. a. 17,351 1
1863-64 - - -	1,92,638 8 9	29,080 14 8	1,234 3 -	1,134 15 7	- - -	2,24,288 10 -	2,49,428 13 3	14,730 13
1864-65 - - -	2,03,322 11 3	32,524 1 9	2,134 - -	331 15 9	975 2 2	2,39,287 14 11	2,21,748 13 -	15,645 14
1865-66 - - -	2,23,810 12 3	26,066 11 -	1,856 5 -	979 15 4	- - -	2,52,713 11 7	2,57,458 14 9	17,820 15
OFFICIAL YEAR.	P U N J A B.						C E N T R	
	Cash Receipts on Account Private Messages.	Cash Receipts on Account Service Messages.	Cash Receipts on Account Telegraph Service Messages.	Receipts by Fines.	Receipts by Sale of Unserviceable Stores.	TOTAL.	Cash Receipts on Account Private Messages.	Cash Rec on Account S Messag
1862-63 - - -	Rs. a. p. 33,587 12 6	Rs. a. p. 25,101 3 -	Rs. a. p. 947 10 -	Rs. a. p. 578 8 2	Rs. a. p. - - -	Rs. a. p. 60,215 1 8	Rs. a. p. 18,328 10 -	Rs. a. 4,072 -
1863-64 - - -	42,431 - 9	45,646 2 6	1,523 - -	409 - 10	- - -	90,099 4 1	20,795 2 6	4,474 1
1864-65 - - -	47,595 2 3	28,345 15 -	382 6 -	245 3 6	1,208 12 6	77,717 7 3	22,452 4 3	5,143 -
1865-66 - - -	43,453 15 6	21,783 6 -	588 10 -	410 14 10	- - -	66,186 14 4	22,788 8 -	6,308 -
OFFICIAL YEAR.	D A C C A.						I N D O R E.	
	Cash Receipts on Account Private Messages.	Cash Receipts on Account Service Messages.	Cash Receipts on Account Telegraph Service Messages.	Receipts by Fines.	Receipts by Sale of Unserviceable Stores.	TOTAL.	Cash Receipts on Account Private Messages.	Cash Rec on Account S Messag
1862-63 - - -	Rs. a. p. 6,425 15 -	Rs. a. p. 703 - 6	Rs. a. p. 280 8 -	Rs. a. p. 175 13 -	Rs. a. p. - - -	Rs. a. p. 7,585 4 6	Rs. a. p. 16,072 11 6	Rs. a. 2,790 -
1863-64 - - -	6,029 14 6	461 14 -	373 2 -	100 5 3	- - -	6,965 3 9	21,924 15 8	1,790 1
1864-65 - - -	9,316 4 6	426 10 -	439 3 -	43 15 -	433 9 9	10,659 10 3	27,447 13 -	2,186 1
1865-66 - - -	15,775 8 -	613 3 -	418 4 -	106 11 1	- - -	16,913 10 1	33,427 5 3	2,539 -

STATEMENT 8.

ges, Fines, and Sale of Unserviceable Stores during the Years 1862-63, 1863-64, 1864-65, 1865-66.

B O M B A Y.				MADRAS AND SOUTH-EAST COAST, AND SHARE DUE BY CEYLON.					
Receipts on Telegraph Messages.	Receipts by Fines.	Receipts by Sale of Unserviceable Stores.	TOTAL.	Cash Receipts on Account Private Messages.	Cash Receipts on Account Service Messages.	Cash Receipts on Account Telegraph Service Messages.	Receipts by Fines.	Receipts by Sale of Unserviceable Stores.	TOTAL.
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>
8 -	974 10 -	- - -	2,19,956 8 3	1,17,287 15 11	11,972 14 6	1,026 5 -	13 - -	- - -	1,30,300 3 5
15 -	742 9 9	- - -	2,67,102 3 -	1,38,715 4 4	13,098 1 6	1,503 13 -	122 14 3	- - -	1,53,440 1 -
2 -	334 8 6	922 2 -	2,42,082 8 -	1,34,203 14 6	14,004 15 6	441 11 -	5 4 8	3,179 13 2	1,51,835 10 1
9 -	683 14 9	- - -	2,70,182 3 -	1,47,698 1 6	11,815 9 -	2,154 12 -	47 - 11	- - -	1,61,715 7 5
A O R N A G P O R E.				P E G U.					
Receipts on Telegraph Messages.	Receipts by Fines.	Receipts by Sale of Unserviceable Stores.	TOTAL.	Cash Receipts on Account Private Messages.	Cash Receipts on Account Service Messages.	Cash Receipts on Account Telegraph Service Messages.	Receipts by Fines.	Receipts by Sale of Unserviceable Stores.	TOTAL.
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>
9 -	243 11 9	- - -	23,107 15 3	14,089 4 -	3,506 8 -	- - -	37 - -	- - -	17,722 12 -
3 -	132 - -	- - -	26,206 8 -	22,819 5 -	5,808 2 -	- - -	41 13 9	- - -	28,669 4 9
3 -	- - -	26 1 8	27,973 1 5	29,612 - -	6,195 13 -	- - -	31 2 6	19 6 -	35,858 5 6
4 -	125 - 11	- - -	29,436 8 5	43,276 9 6	6,329 4 -	- - -	36 10 9	- - -	49,642 8 3
I N D O R E.				E A S T C O A S T O R G A N J A M.					
Receipts on Telegraph Messages.	Receipts by Fines.	Receipts by Sale of Unserviceable Stores.	TOTAL.	Cash Receipts on Account Private Messages.	Cash Receipts on Account Service Messages.	Cash Receipts on Account Telegraph Service Messages.	Receipts by Fines.	Receipts by Sale of Unserviceable Stores.	TOTAL.
<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>
13 -	254 12 -	- - -	10,377 6 6	35,234 12 6	4,168 10 -	399 3 -	108 9 9	- - -	39,971 3 3
8 -	91 5 6	- - -	24,527 9 2	42,656 15 5	4,252 8 -	331 - -	167 15 9	- - -	47,428 7 2
14 -	28 - -	1,704 2 3	32,076 10 3	51,341 10 6	4,031 8 6	720 10 -	5 12 11	1,317 9 1	57,417 3 -
2 -	124 11 2	- - -	36,440 8 5	58,361 1 2	4,084 6 6	274 4 -	120 12 9	- - -	62,840 8 5

STATEMENT 8.—Statement showing the Receipts on Account of Private Service, Departmental or Telegraph S

OFFICIAL YEAR.	SCINDE.						RAJPOOTANA	
	Cash Receipts on Account Private Messages.	Cash Receipts. on Account Service Messages.	Cash Receipts on Account Telegraph Service Messages.	Receipts by Fines.	Receipts by Sale of Unserviceable Stores.	TOTAL.	Cash Receipts on Account Private Messages.	Cash
	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs.</i>
1862-63 - - -	22,686 9 -	4,866 5 6	368 15 -	356 6 3	- - -	28,278 3 9	—	
1863-64 - - -	38,805 6 3	5,225 3 -	892 15 -	69 11 9	- - -	44,993 4 -	—	
1864-65 - - -	45,577 - -	5,312 15 6	1,438 8 -	10 8 -	- 6 -	52,339 5 6	—	
1865-66 - - -	1,37,005 7 3	5,473 4 -	1,555 2 -	145 8 8	- - -	1,44,179 5 11	3,830 8 -	35
OFFICIAL YEAR.	BANGALORE.*						ASSAM.*	
	Cash Receipts on Account Private Messages.	Cash Receipts on Account Service Messages.	Cash Receipts on Account Telegraph Service Messages.	Receipts by Fines.	Receipts by Sale of Unserviceable Stores.	TOTAL.	Cash Receipts on Account Private Messages.	Cash
	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs.</i>
1862-63 - - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	-
1863-64 - - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	-
1864-65 - - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	-
1865-66 - - -	5,142 6 -	609 8 -	85 - -	- - -	- - -	5,786 14 -	1,908 7 -	1,07

* These Divisions were formed in January 1866.

STATEMENT 9. - - - - -

STATEMENT showing the Expenditure of the Government Telegraph Department

	Direction.	Bengal.	Punjaub.	Bombay.	Madras and South-East Coast.	East Coast or Ganjam.	Central India or Nagpore.	In
	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs.</i>
1862-63 - - -	66,966 13 10	1,91,929 1 -	1,21,647 11 -	1,60,606 3 3	1,27,957 3 9	90,869 12 1	1,14,248 - 6	61,45
1863-64 - - -	67,282 11 1	1,80,095 1 6	1,27,708 2 7	1,64,028 1 -	1,47,602 10 10	95,118 4 2	1,15,407 15 10	66,01
1864-65 - - -	49,132 9 2	2,43,779 7 5	1,45,844 14 4	1,72,371 5 9	1,83,201 15 -	1,06,863 2 8	1,03,455 12 8	73,18
1865-66 - - -	93,291 13 10	2,50,870 2 2	1,23,586 6 4	1,86,062 13 4	1,63,271 12 1	92,906 11 2	1,06,159 10 3	81,59

N.B.—The Salaries, Office Establishment, and Contingencies of the Directors of Eastern, Western, and S

Receipts, Fines, and Sale of Unserviceable Stores during the Years 1862-63, 1863-64, 1864-65, and 1865-66—*cont'd.*

RAJPOOTANA.*				MALABAR COAST.*					
Receipts on Account Private Messages.	Receipts by Fines.	Receipts by Sale of Unserviceable Stores.	TOTAL.	Cash Receipts on Account Private Messages.	Cash Receipts on Account Service Messages.	Cash Receipts on Account Telegraph Service Messages.	Receipts by Fines.	Receipts by Sale of Unserviceable Stores.	TOTAL.
<i>a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
12 -	- - -	- - -	4,384 5 -	16,438 9 -	658 12 -	24 - -	- - -	- - -	17,121 5 -
ASSAM.*				TOTAL.					
Receipts on Account Private Messages.	Receipts by Fines.	Receipts by Sale of Unserviceable Stores.	TOTAL.	Cash Receipts on Account Private Messages.	Cash Receipts on Account Service Messages.	Cash Receipts on Account Telegraph Service Messages.	Receipts by Fines.	Receipts by Sale of Unserviceable Stores.	TOTAL.
<i>a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>
- - -	- - -	- - -	- - -	6,42,700 10 5	1,02,528 3 6	5,846 3 -	4,275 5 8	1,700 - -	7,57,050 6 7
- - -	- - -	- - -	- - -	7,76,445 6 5	1,24,577 9 2	9,574 11 -	3,032 12 5	1,700 - -	9,15,330 7 -
- - -	- - -	- - -	- - -	7,92,557 9 3	1,13,818 3 3	10,048 9 -	1,036 6 10	9,787 - 7	9,27,247 12 11
- - -	- - -	- - -	2,887 6 -	10,10,270 1 2	1,05,535 10 6	10,847 - -	2,781 8 2	- - -	11,29,440 3 10

* These Divisions were formed in January 1866.

STATEMENT 9.

Working and Maintenance of the Lines for the Years 1862-63, 1863-64, 1864-65, and 1865-66.

Division.	Dacca.	Pegu.	Malabar Coast.*	Bangalore.*	Assam.*	Rajpootana.*	Workshop, Store, and Printing.	TOTAL.
<i>a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>
1862 12 2	1,33,668 10 3	78,795 12 3	- - -	- - -	- - -	- - -	93,501 3 4	13,16,968 4 6
1863 11 9	47,996 10 9	7,476 10 3	- - -	- - -	- - -	- - -	2,28,750 8 9	13,65,560 13 1
1864 14 4	66,985 8 7	87,948 3 1	- - -	- - -	- - -	- - -	1,93,168 3 9	15,34,498 - 5
1865 15 11	69,708 3 2	1,13,716 8 5	34,774 9 2	19,578 3 6	20,359 5 3	17,435 6 10	1,78,829 - -	16,33,922 15 9

* These Divisions were formed in January 1866.

Accounts are included in the Accounts of the Bengal, Bombay, and Madras Divisions respectively.

		110	18	110	-	-	-	-	-	-	-	110	-	-	-	No. 1	Dawerjeehore - Loyach Barum	Spanned.
TOTAL Miles	-	899	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcutta to Madras, through Raneeunge—1,179½ Miles:																		
Calcutta to Burdwan	Bengal	69	16 & 20	51	15	3 masis	-	-	-	-	-	69	-	-	-	No. 1	Hooghly	Cabled. Four in use.
Burdwan to Raneeunge	"	57	16	57	-	-	-	-	-	-	-	57	-	-	-	No. 1.	Damoodur Dulkishur	Spanned.
Raneeunge to Midnapore	Ganjam	99	20	99	-	-	-	-	-	-	-	-	-	99	-	No. 1	Salay Cassy	Spanned.
Midnapore to Balasore	"	78	16 & 18	69	9	-	-	-	-	-	-	34	-	44	-	Nos. 1 and 4	Soolhanrecka Boorabolong	Cabled.
Balasore to Cuttack	"	110	16 & 20	98	7¼	-	-	-	-	-	-	-	-	107¾	-	Nos. 1 and 8	Sylinddee Bytarnee Kursoowa Brahmunny	Spanned. - ditto. Cabled. Spanned.
Cuttack to Berhampore	"	114½	16 & 20	2¼	111¼	-	-	-	-	-	-	-	-	113½	-	No. 1	Katjoorie Rookie Garjam	- ditto.
Berhampore to Chicacole	"	99½	16 & 20	56¾	42	-	-	-	-	-	-	-	-	99½	-	No. 1	Cotapillay Byree	- ditto.
Chicacole to Vizagapatam	"	62	20	-	61½	-	-	-	-	-	-	-	-	57	-	No. 1	Chicacole Konada Chittivusa	- ditto.
Vizagapatam to Dowlaishwaram	"	124	20	3 in No. 123½	-	½	-	-	-	-	-	-	-	71	-	Nos. 1 and 4	Anakapilly Pundyarie Tonnee	Spanned.
Dowlaishwaram to Bezwarrah	"	87	16 & 20	31	53	-	-	-	-	-	-	14	-	70	-	No. 1	Godavery Krishna	Cabled.
Bezwarrah to Ongole	Madras	86	20	-	-	-	-	-	-	-	-	-	-	86	-	No. 1	Goondlakama Palar	Spanned.
Ongole to Singrakonda	"	20	20	-	-	-	-	-	-	-	-	-	-	20	-	No. 1	Moosee Pennaur	- ditto.
Singrakonda to Nellore	"	68	16	-	-	-	-	-	-	-	-	-	-	68	-	No. 1	Minnanoor Cootalar	- ditto.
Nellore to Madras	"	106	16	2	-	-	-	-	-	-	-	-	-	106	-	Nos. 1 and 8	Minnanoor	- ditto.
TOTAL Miles	-	1,179½	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Madras to Manaar Island, through Pondicherry and Paumben—393 Miles:																		
Madras to Mount and Negapatnam.	Madras	208	18	15½	-	-	-	-	-	-	-	206	-	-	-	No. 1	Palar Ariancoopum Charabar Phoonar Guddalum Vellaar Coleroon Trenalroyappalam Karikal Nagoor	Line supported on five lofty posts. Spanned. Supported on bamboos. Ditto, on stone pillars. Ditto, on teak posts. 3 strand wire, one span. Supported on stones projecting from bridge. One span.

Madras to Manaar Island, through Pondicherry and Paumben—393 Miles:

Madras to Mount and Nega- patam.	-	208	18	15 $\frac{1}{2}$	-	11 $\frac{3}{4}$	150
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APPENDIX (A.)—State of Lines, Nature of Insulation and Supports, and Distances between Offices—continued.

SECTIONS.	In which Division.	SUPPORTS.										INSULATION.				RIVER CROSSINGS.							
		Number of Miles of each Description.										Number of Miles of each Description.				Name of River.	Width in Yards.	Whether Cabled or Spanned.					
		Permanent.					Temporary.					Number of Miles of each Description.											
		Hamilton's $\frac{1}{2}$.	Hamilton's $\frac{3}{4}$.	Stone Pillars.	Iron-wood.	1st Class Ordinary Wood.	2nd Class Ordinary Wood.	Inferior Wood.	Brick Pillars.	Brooke's Pattern.	Douglas's Pattern.	Bell-shaped Stoneware.	Uninsulated.	Size of Wire.									
Number of Posts per Mile.												Number of Miles.											
Madras to Manar Island, through Pondicherry and Paumben—393 Miles—continued.																							
Negapatam to Lutchmunaguddy.	Madras.	26	20	15	11	-	-	-	-	-	-	-	-	26	No. 1.	Puttocottah - 187 2	Spanned.						
Lutchmunaguddy to Puttocottah.	"	26	20	-	26	-	-	-	-	-	-	-	-	26	No. 1.	Coottaguddy - 205 3							
																Amboolee - 227 0							
																Velloree - 171 1							
																Vellaar - 227 2							
																Membosil - 206 0	Cabled and spanned.						
																Poornamungalum - 274 0							
																Paumben - 160 1							
																Tetadranam - 210 1							
																Vettaram - 264 2							
																ditto - 264 0	Spanned and cabled.						
																Manarguddy - 293 0							
																Tirpalguddy - 206 0							
																Antuncurray - 299 0							
Tonitory to Thanicour Point	"	18	20	-	18	-	-	-	-	-	-	-	-	18	No. 1.		Spanned and cabled.						
TOTAL Miles		393																					
Madras to Bombay, through Bangalore and Bellary—936 Miles:																							
Madras to Vellore	Bangalore	85	20	29	-	-	-	35	33	-	-	-	-	52	No. 1	Palar -		Spanned.					
Vellore to Bangalore	"	127	16	9	-	-	-	2	9	-	-	-	-	118	No. 1	Ugaram -							
Bangalore to Hericour	"	100	20	0 $\frac{1}{2}$	-	-	-	18	0 $\frac{1}{2}$	-	-	-	-	99 $\frac{1}{2}$	No. 1	Yeddavutty -							
Hericour to Bellary	"	92	17	53 $\frac{1}{2}$	-	-	-	7 $\frac{1}{2}$	55	-	-	-	-	39	No. 1.								
Bellary to Dhurwar	"	157	16	80	-	-	-	4	37	-	-	-	-	120	No. 1.	Tongabudra -							
Dhurwar to Belgam	"	45	16	33	-	-	-	12	-	-	-	-	-	45	No. 1	Mulparba -							
Belgaum to Kolapore	Bombay	70	16	70	-	-	-	-	35	-	-	-	-	35	No. 1	Kaikul -							
																Karrar -							
Kolapore to Sattara	"	16	16	76	-	-	-	-	-	-	-	-	-	76	No. 1	Warash -							
Sattara to Poona	"	64	16	64	-	-	-	-	64	-	-	-	-	-	No. 1.	Kolapore -							
Poona to Bombay	"	120	16	120	-	-	-	-	55	-	-	-	-	-	No. 1.								

Line	From	To	Miles	Wires	Notes
Bombay to Surat	Bombay	Surat	169	16	169
Surat to Broach	"	Broach	40	16	40
Broach to Baroda	"	Baroda	48	16	48
Baroda to Ahmedabad	"	Ahmedabad	65	16	65
Ahmedabad to Deesa	"	Deesa	98	16	98
TOTAL Miles			420		
Agra to Peshawur, through Umballa and Lahore.—711 Miles:					
Agra to Allypore	Punjab	Allypore	50	16	50
Allypore to Delhi	"	Delhi	80	16	80
Delhi to Umballah	"	Umballah	120	16	120
Umballah to Jullundur	"	Jullundur	104	16	104
Jullundur to Unrisur	"	Unrisur	54	16	54
Unrisur to Lahore	"	Lahore	34	16	34
Lahore to Rawal Pindee	"	Rawal Pindee	169	16, 20, & 24	169
Rawal Pindee to Attock	"	Attock	55	16	55
Attock to Peshawur	"	Peshawur	45	16	45
TOTAL Miles			711		

APPENDIX (A).—State of Lines, Nature of Insulation and Supports, and Distances between Offices—*continued.*

SECTIONS.	In which Division.	Number of Miles.	Number of Posts per Mile.	SUPPORTS.						INSULATION.				Size of Wire.	RIVER CROSSINGS.			
				Number of Miles of each Description.						Number of Miles of each Description.					Name of River.	Width in Yards.	Whether Cabled or Spanned.	
				Permanent.			Temporary.			Brooke's Pattern.	Douglas's Pattern.	Bell-shaped Stoneware.	Uninsulated.					
				Hamilton's 4s	Hamilton's 3s	Stone Pillars.	Iron Wood.	1st Class Ordinary Wood.	2nd Class Ordinary Wood.									Interior Wood.
Lahore to Hyderabad, through Mooltan and Sukkur—857 Miles.																		
Lahore to Mooltan	Scind	200	18	200	-	-	-	-	-	-	-	-	200	No. 1.	-	Indus	5,190	Cabled. Bank Offices open.
Mooltan to Deera Gaze Khan.	"	45	18	45	-	-	-	-	-	-	-	45	-	No. 1	-	Chenab	5,755	-
Deera Ishmail Khan to Rajmupore.	"	197	18	197	-	-	-	-	-	-	-	197	-	No. 1.	-	-	-	-
Rajmupore to Sukkur	"	210	18	210	-	-	-	-	-	-	210	-	-	No. 1.	-	Indus	1,233	Spanned.
Sukkur to Tarosha	"	80	18	80	-	-	-	-	-	-	80	-	-	No. 1	-	Indus	200	- ditto.
Tarosha to Hyderabad	"	125	18	125	-	-	-	-	-	-	125	-	-	No. 1	-	Fullalie	-	-
TOTAL Miles				857														
Carragolah to Cachar, through Cooch Behar and Doobree—670 Miles.																		
Peerpointee to Carragolah	Bengal	10	16	3	-	-	-	-	-	-	-	-	5	No. 8.	-	-	-	-
Carragolah to Purneah	Assam	27	16	27	-	-	-	-	-	-	-	-	27	No. 1.	-	-	-	-
Purneah to Titaleah	"	80	16	80	-	-	-	-	-	-	-	-	80	No. 1	-	Mahanuddy	800	Spanned.
Titaleah to Rungpore	"	116	16	116	-	-	-	-	-	-	-	-	116	No. 1.	-	-	-	-
Rungpore to Cooch Behar	"	52	25	-	-	-	-	-	-	Bamboos	-	-	52	No. 8	-	Teesta	2,200	- ditto.
Cooch Behar to Doobree	"	44	22	-	-	-	-	-	-	ditto	-	-	44	No. 8	-	Gangarai	1,716	- ditto.
Doobree to Gawalparah	"	50	16	50	-	-	-	-	-	-	-	-	-	No. 1	-	Aganunee	600	- ditto.
Gawalparah to Gowhaty	"	77	16	77	-	-	-	-	-	-	-	-	-	No. 1.	-	Berhampootra	6,000	Cabled.
Gowhaty to Cherrapoonjee	"	108	-	-	-	-	-	-	-	-	-	-	-	Nos. 1 & 8.	-	-	-	-
Cherrapoonjee to Sylhet	"	36	16	29	-	-	-	-	-	-	-	-	-	Nos. 1 & 8	-	Peine Chingra	200	Spanned.
Sylhet to Cachar	"	70	16	70	-	-	-	-	-	-	-	-	-	No. 1	-	Koora Soorma	250	- ditto.

[illegible]

APPENDIX (A).—State of Lines, Nature of Insulation and Supports, and Distances between Offices—continued.

SECTIONS.	In which Division.	Number of Miles.	Number of Posts per Mile.	SUPPORTS.						INSULATION.				RIVER CROSSINGS.				
				Number of Miles of each Description.						Number of Miles of each Description.				Size of Wire.	Name of River.	Width in Yards.	Whether Cabled or Spanned.	
				Permanent.		Temporary.				Brooke's Pattern.	Douglass's Pattern.	Bell-shaped Stone-ware.	Uninsulated.					
				Hamilton's 4s.	Hamilton's 4s.	Iron Wood.	1st Class Ordinary Wood.	2nd Class Ordinary Wood.	Inferior Wood.									Brick Pillars.
Burdwan to Benares, through Patna—473 miles.																		
Burdwan to Sahibgunge	Bengal	152	16		152						152			No. 1		Ajijai	Taken along Railway Bridge.	
Sahibgunge to Patna	"	183	16		183						183			No. 1		Khul, Hullohur	- ditto.	
Patna to Benares	"	138	16	10	138						138			No. 1		Sone	- ditto.	
TOTAL Miles		473													900	Ganges	Cabled. Two Cables in use.	
Raneeunge to Mogulsrai, through Burhee—282 miles.																		
Raneeunge to Burhee	Bengal	124	16		124						124			No. 1		Burakur	Spanned.	
Burhee to Mogulsrai	"	158	16 & 20	39	119						158			No. 1		Sone Mohr	Cabled. Spanned.	
TOTAL Miles		282																
Belgaum to Paumben, through Goa and Cochim—992 miles.																		
Belgaum to Vingorla	Malabar Coast	65	16						65					No. 1		Moochamad	Spanned.	
Vingorla to Goa	"	30	16	30							2*			No. 1		Aronda Wydonghur Panjim	Cabled.	
Goa to Margao	"	20	16	20							20*			No. 4		Aksi	ditto.	
Margao to Carwar	"	40	16	40										No. 4		Galzeebaugh Talpan Sedasteghur Kolanuddy	Spanned.	
Carwar to Coompta	"	41	16	41							41*			Nos. 1 & 4		Gaugawali Mirjen	Cabled. Spanned.	
Coompta to Mangalore	"	124	16	124							124*					Honavar or Sherrawutty Kundapur Maboook Calianpoora Udiawadi Hejandi	Ditto.	

[illegible]

* With the exception of angle posts.

Benares to Hyderabad (Deccan), through Jubbulpore and Nagpore—833 miles,

TOTAL Miles

833

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E 4

37.

APPENDIX (A).—State of Lines, Nature of Insulation and Supports, and Distances between Offices—*continued*.

SECTIONS.	In which Division.	Number of Miles.	Number of Posts per Mile.	SUPPORTS.						INSULATION.				RIVER CROSSINGS.			
				Number of Miles of each Description.						Number of Miles of each Description.				Name of River.	Width in Yards.	Whether Cabled or Spanned.	
				Permanent.			Temporary.			Brooke's Pattern.	Douglas's Pattern.	Bell-shaped Stoneware.	Uninsulated.				
				Hamilton's $\frac{1}{2}$.	Hamilton's $\frac{1}{4}$.	Stone Pillars.	Iron-wood.	1st Class Ordinary Wood.	2nd Class Ordinary Wood.								Inferior Wood.
Bangalore to Mercara, through Mysore—159 Miles.				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bangalore to Mysore	Bangalore	84	16	-	-	53	31	-	-	-	-	-	31	Cavery	400	Spanned.	
Mysore to Mercara	"	75	16	10	-	-	-	65	-	-	10	-	65	Branch of Cavery	250	Spanned.	
TOTAL Miles	- - -	159												Muddoor	200	ditto.	
														Unravutty	80	ditto.	
														Hoonsoor	100	ditto.	
Futteyghur to Delhi, through Bareilly—291 Miles.				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Futteyghur to Shahjehanpore.	Punjab	54	20	-	-	-	-	54	-	-	-	-	54	Ganges	Unknown	Cabled.	
Shahjehanpore to Bareilly	"	51	20	-	-	-	-	51	-	-	-	-	51	Rangunga	800	Spanned.	
Bareilly to Moradabad	"	63	20	-	-	-	-	63	-	-	-	-	63	Gurrah	250	Spanned.	
Moradabad to Meerut	"	79	16 & 20	50 $\frac{1}{2}$	-	-	-	-	28 $\frac{1}{2}$	-	-	-	79	Tangra	250	ditto.	
Meerut to Delhi	"	44	16	44	-	-	-	-	-	-	12	-	32	Dojora	300	ditto.	
TOTAL Miles	- - -	291												Cossy	300	ditto.	
														Rangunga	1,000	Supported on 3 masonry piers.	
														Ganges	2,300	1,200 yards on masonry pillars;	
														Hindun	-	1,100 yards boat crossings.	
														Jumna	-	Breadth of rivers and their crossings the same as on the line Allypore to Delhi; both lines on same supports.	
Meerut to Mussoorie, through Roorkee—130 Miles.				-	-	-	-	-	-	-	-	-	-	-	-	-	-
Meerut to Mussoorie	Punjab	130	16	118	-	-	-	-	-	-	-	-	-	-	-	-	-
Indore to Neemuch, through Rutlam—143 Miles.	Indore	60	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indore to Rutlam	Indore	83	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Calcutta to Diamond Harbour.	Bengal -	-	30	16	-	27	3 Masts
Calcutta to Saugor Island Light House, through Hooghly Point—86 Miles.	Bengal	-	16	20	-	-	16
Allipore to Atchepore	"	-	20	20	-	-	-
Atchepore to Hooghly Point.	"	-	8	20	-	8	-
Hooghly Point to Diamond Harbour.	"	-	22	20	-	-	22
Diamond Harbour to Mud Point.	"	-	20	20	-	-	20
Mud Point to Saugor Island	"	-	86	-	-	-	-
TOTAL Miles	-	-	-	-	-	-	-
Benares to Agra, through Cawnpore—397 Miles.	Bengal	-	75	20	-	75	-
Benares to Allahabad	"	-	135	16	-	83	-
Allahabad to Cawnpore	"	-	85	16	-	85	-
Cawnpore to Futtyghur	"	-	112	16	-	112	-
Futtyghur to Agra	"	-	397	-	-	-	-
TOTAL Miles	-	-	-	-	-	-	-
Cawnpore to Fyzabad, through Lucknow—133 Miles.	Bengal	-	53	16	-	53	-
Cawnpore to Lucknow	"	-	80	16	-	80	-
Lucknow to Fyzabad	"	-	133	-	-	-	-
TOTAL Miles	-	-	-	-	-	-	-
Hydrabad to Bellary, through Kurnool—223½ Miles.	Bangalore	-	127	16	-	38½	-
Hydrabad to Kurnool	"	-	196½	16	-	69½	0½
Kurnool to Bellary	"	-	223½	-	-	-	-
TOTAL Miles	-	-	-	-	-	-	-
Titaleah to Rajelings—55 Miles.	Assam	-	31	16	-	-	-
Titaleah to Punkabarree	"	-	24	16 & 20	-	-	24
Punkabarree to Darjeeling	"	-	55	-	-	-	-
TOTAL Miles	-	-	-	-	-	-	-
Moradabad to Nynee Tal—66 Miles.	Punjab	-	66	16	-	50	-
Moradabad to Nynee Tal	"	-	-	-	-	-	-
TOTAL Miles	-	-	-	-	-	-	-

• With the exception of angle posts.

The distance by the road, which is circuitous from Kurnool to Hyderabad, is 96½ miles.

and over rocks, crossing two rivers by spans; wire on supports is reduced to 80½ miles.

Chicacole to Callagapatam—15 Miles:		15	20	1	14	-	-	-	-	-	-	-	-	15	No. 1.	-	-	-
Chicacole to Callagapatam	Ganjam																	
Dowlaiswaram to Neelapilly through Coconada—48 Miles:																		
Dowlaiswaram to Coconada	Ganjam	32	20	-	-	-	-	-	-	-	-	-	-	32	No. 1.	-	-	-
Coconada to Neelapilly	"	16	20	16	-	-	-	-	-	-	16	-	-	-	No. 8	-	300	Spanned.
TOTAL Miles—		48																
Sironcha to Damagodium—129 Miles:																		
Sironcha to Damagodium	Nagpore	-	20	-	-	-	-	45	-	-	-	-	-	75	Nos. 1, 8, & 19	-	700 800 120	Spanned.
Bezwarrah to Masulipatam—43 Miles:																		
Bezwarrah to Masulipatam	Madras	-	20	-	-	-	43	-	-	-	-	-	-	-	No. 1.	-	-	-
Bezwarrah to Hyderabad—170 Miles:																		
Bezwarrah to Hyderabad	Madras	-	16	145	-	-	-	-	-	25	-	-	-	25	No. 1	-	650 240 700	3 standards in bed of river. Spanned. 2 wooden posts in masonry in bed of river.
Madras Local Lines—3½ Miles:																		
Observatory to Time Ball on Custom House.	Madras	-	3½	-	-	-	3½	-	-	-	2½	-	-	-	No. 3.	-	-	-
Bombay Local Lines—70 Miles:																		
Bombay to Matheran through Parell.	Bombay	-	60	20	-	-	-	26	-	-	60	-	-	-	No. 1.	-	-	-
Bombay to Malabar Point	"	-	5	20	-	-	-	5	-	-	-	-	-	5	No. 8.	-	-	-
Poona to Ganneshkhind	"	-	5	16 & 20	-	-	-	-	-	-	-	-	3	2	No. 4.	-	-	-
TOTAL Miles—			70															
Calcutta Local Lines—4½ Miles:																		
Observatory in Park-street to the Time Ball Tower in Fort William.	Bengal	-	1½	under ground	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcutta Signal Office to Belvidere through the Bengal Secretariat Office.	"	-	3	10	-	-	-	-	-	-	3	-	-	-	No. 8.	-	-	-
TOTAL Miles—			4½															
TOTAL Miles—																		13,385½

* Line for 1½ miles erected on the Ajmere to Erinpore line supports.
† Thirty-four miles of this line are supported on the posts of the Nasick Line.

APPENDIX (B.)

GOVERNMENT TELEGRAPH DEPARTMENT.—COMPLAINT AND CHECK OFFICE.

(No. 3194.)

From *T. McKelvey*, Esq., Assistant Superintendent in Charge, Complaint and Check Office, to Lieutenant Colonel *D. G. Robinson*, R.E., Director General of Telegraphs in India.

Sir,

Calcutta, 16th March 1866.

I HAVE the honour to submit the following brief report on the working of the Complaint and Check Office since the date of my taking charge on 12th August 1865.

The business of this Office is :

- I. Investigation of all Complaints regarding messages.
- II. Checking the cost of messages.
- III. Examination of all service messages so as to detect those not strictly on public service.
- IV. Comparison of all copies of messages with their originals in order to discover the faults made in transmission.

I.—*Complaints.*

Complaints are generally of the following nature :—

1. Error in transmission.
2. Delay of transmission.
3. Misdelivery of messages.
4. Non-delivery of messages.
5. Overcharge of messages.

Refunds are granted in the following cases :

- (1.) When the errors made in transmission so affect the sense of the message as to render it partly or entirely useless.
- (2.) When delay exceeds two-thirds the postal time between the stations.
- (3 & 4.) When the misdelivery or non-delivery is attributable to any error or fault made in transmission.
- (5.) When overcharge has been really made.

On my taking charge of the office (12th August last) the register showed that, from 1st May, 654 complaints had been received; of these 251 remained uninvestigated, although many of them referred to messages sent in March, April, and May, and had been over two months on the books. These arrears, together with 118 other current complaints, were all settled before the end of October; and since then the average number of complaints received monthly has been 50. These have all been investigated with no more delay than was necessary for references to offices in fault, and refunds were granted in all cases where the complainant requested it, and was found to be entitled to it.

The subjoined abstract shows the number of complaints disposed of under their respective headings, from 1st May 1864 up to 31st January 1866, together with the number of refunds granted for mutilation and delays.

Annexed is also a table showing the monthly and weekly average maxima and minima times of transit of messages between the Presidency towns, Kurrachee, Rangoon, and Galle, from 1st May 1865 to 1st March 1866.

II.—*Cash Checking.*

In this branch I found that, notwithstanding the cash checking of messages from January to April, both inclusive, had been jumped over, the checking for May had not been quite finished.

I must observe, however, that cash checking is necessarily a slow process; every mes-
sage

sage sent must be examined. The number of words it contains, its register number, and the price which should be paid for its transmission must be entered in the check books for the different offices, and then the monthly totals of these books compared with the amounts paid into the Treasury from each office as shown by the Treasury receipts.

Hence the arrears of this business were not so speedily disposed of as were those of the complaints; but the work has been brought up to date, and is now going on steadily.

III.—*Examination of Service Messages.*

I found this work unfinished for May. It was, however, brought up to date before the end of December, and under the present arrangements the examiner can always have his work completed and the monthly return ready for submission to Government within the month.

IV.—*Comparison of Message Drafts.*

Consequent on the increase of establishment this operation was introduced on 15th January.

Every copy of a message is attached to the original; the faults, if any, and the parties to blame for them are noted in a book; the "fine statements" containing the names of the parties in fault, the amount of fine imposed, and the nature of fault are at once prepared and sent to the superintendent of division, as well for his information as for recovery of the fines.

Taking into consideration that the hands employed at this business are all new, and that message drafts are badly arranged, many of them irregular in their numbers, and having neither the dates nor names of the offices from which they have been received marked upon them, I must say that the comparison of drafts is proceeding satisfactorily. The clerks have now learned to trace messages through the various stations, and have become acquainted with the nature of their work, and when the message drafts are arranged according to the circular about to be issued, I expect we shall be well able to keep pace with the increase of messages, to exercise a constant supervision over the working in the signal offices, and to maintain an efficient check against faults.

From the foregoing it will be seen that on my taking charge every branch of the office was considerably in arrears: these arrears have long since disappeared; the current work has been promptly attended to, and this has been effected, I beg to observe, without the aid of any additional establishment.

APPENDIX (B.)—Government Telegraph Department.—Complaint and Check Office.—continued.

ABSTRACT OF COMPLAINTS.	1864 to 1865.												1865 to 1866.												TOTAL.											
	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.		April.		TOTAL.	May.	June.		July.	August.		Sept.	October.			Nov.	Dec.		January.							
											I	E	I	E			I	E		I	E		I	E			I	E	I	E	I	E	I	E	I	E
1. Number groundless - - -	4	9	11	14	7	6	2	0	4	1	3	0	10	0	71	0	13	3	6	3	4	21	4	4	2	3	5	2	2	3	2	6	5	7	43	52
2. Number regarding messages slightly delayed in transmission, or which contained slight errors, and for which refunds were not granted -	13	14	32	24	20	24	32	10	8	11	11	0	7	1	206	1	16	1	23	1	4	10	14	0	1	4	5	6	7	4	14	2	6	3	90	31
3. Number regarding messages which did not reach their destination in two-thirds of the Postal time, and for which refunds were given -	10	32	39	96	83	24	46	11	3	4	10	0	6	0	364	0	191	0	196	1	61	4	13	0	7	0	7	0	11	0	13	2	7	0	506	7
4. Number regarding mutilated messages for which refunds were given - - -	16	19	9	14	11	12	7	19	18	17	8	2	9	0	159	2	7	4	15	3	12	14	4	4	7	8	12	11	6	11	10	10	5	4	78	69
GRAND TOTAL - - -	43	74	91	148	121	66	87	40	33	33	32	2	32	1	800	3	227	8	240	8	81	49	35	8	17	15	29	19	26	18	39	20	23	14	717	159

Note.—The letters I E denote that the messages were Indo-European.

TABLE showing the Weekly and Monthly Average Maxima and Minima between the under-mentioned Stations :

From	To	MAY.			JUNE.			JULY.			AUGUST.			SEPTEMBER.			OCTOBER.			NOVEMBER.			DECEMBER.			JANUARY.			FEBRUARY.												
		Maxima.		Mts.	Maxima.		Mts.	Maxima.		Mts.	Maxima.		Mts.	Maxima.		Mts.	Maxima.		Mts.	Maxima.		Mts.	Maxima.		Mts.	Maxima.		Mts.	Maxima.		Mts.										
		Hrs.	Mts.		Hrs.	Mts.		Hrs.	Mts.		Hrs.	Mts.		Hrs.	Mts.		Hrs.	Mts.		Hrs.	Mts.		Hrs.	Mts.		Hrs.	Mts.		Hrs.	Mts.		Hrs.	Mts.	Hrs.	Mts.	Hrs.	Mts.	Hrs.	Mts.		
CALCUTTA.		MADRAS.																																							
1st -	7th -	30	36	17	3	40	12	15	30	2	17	18	40	5	50	11	20	1	49	2	28	2	46	3	30	4	34	3	25	21	20	5	15								
8th -	15th -	61	50	32	40	17	30	4	19	9	15	6	10	-	47	6	40	1	13	39	-	51	3	42	3	12	5	54	5	40	4	12									
16th -	22nd -	32	40	22	50	34	36	17	30	8	31	2	45	3	39	33	15	5	44	2	40	9	25	32	30	14	30	11	14	7	4	59									
23rd -	End -	7	-	2	25	13	50	9	20	4	33	4	48	3	40	3	51	-	53	9	15	4	25	48	24	5	34	3	20	-	40										
Monthly average -		32	16	18	44	26	32	11	32	10	53	7	53	1	59	13	46	2	24	13	20	2	23	41	10	31	17	16	9	20	3	16									
GALLE.		MADRAS.																																							
1st -	7th -	8	-	5	23	37	-	32	20	39	40	18	20	31	50	11	40	22	15	10	40	27	24	17	24	53	-	56	48	11	45	8	20	26	30	17	36	5	30	1	20
8th -	15th -	6	15	3	57	14	40	3	33	20	48	6	55	13	10	5	40	15	8	12	8	29	36	24	24	27	-	16	-	21	42	11	10	9	-	3	6	50	1	40	
16th -	22nd -	32	24	24	-	19	-	1	12	23	-	20	45	29	20	11	30	19	48	10	-	16	-	15	45	44	15	41	-	23	7	5	34	6	-	1	24	10	40	5	36
23rd -	End -	8	33	5	46	20	-	9	59	25	40	12	50	52	20	36	8	10	3	30	27	37	20	8	39	20	25	40	16	22	12	22	34	30	2	51	7	-	1	30	
Monthly average -		13	48	9	46	22	40	11	46	27	17	14	44	31	40	16	28	16	20	9	19	25	24	19	30	40	53	34	52	18	29	9	21	19	-	6	27	7	20	2	31
BOMBAY.		MADRAS.																																							
1st -	7th -	115	30	72	30	68	24	29	12	34	45	25	-	8	20	4	25	3	14	6	28	6	17	30	-	24	30	23	30	31	9	10	42	2	20	1	-	-	58		
8th -	15th -	75	-	53	30	31	42	27	-	55	15	36	35	2	48	1	9	-	1	40	15	-	2	26	9	-	6	48	20	12	17	-	27	-	12	21	1	40	-	42	
16th -	22nd -	65	-	47	30	62	-	36	-	2	17	1	22	57	1	36	9	15	9	20	15	11	10	15	9	-	5	20	19	37	18	34	8	30	5	29	3	24	1	12	
23rd -	End -	111	48	75	-	40	34	41	36	2	40	1	12	14	25	9	24	3	1	36	18	-	13	30	39	30	7	-	7	20	2	43	2	40	1	40	3	15	1	-	
Monthly average -		91	49	62	7	50	40	33	27	23	44	17	58	11	17	5	6	25	3	57	13	39	8	22	21	52	10	54	17	39	17	19	11	50	7	33	2	39	-	58	

TABLE showing the Weekly and Monthly average Maxima and Minima times of Transit of Messages between the under-mentioned Stations.

From	To	MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		JANUARY.		FEBRUARY.																								
		Maxima.	Minima.	Maxima.	Minima.	Maxima.	Minima.	Maxima.	Minima.	Maxima.	Minima.	Maxima.	Minima.	Maxima.	Minima.	Maxima.	Minima.	Maxima.	Minima.	Maxima.	Minima.																							
BOMBAY.	CALCUTTA.																																											
	1st -	71	57	13	39	67	3	20	0	53	7	52	7	25	25	19	00	14	8	48	1	48	71	39	27	17	18	22	6	42	57	0	21	30	26	51	5	30						
	2nd -	73	5	19	11	49	34	17	30	58	37	27	39	45	57	12	14	36	34	14	24	21	17	2	17	22	00	3	42	16	38	3	40	25	52	5	23	46	05	11	42			
	3rd -	76	52	14	35	50	56	10	52	23	30	6	48	49	51	13	13	31	20	19	20	7	50	4	20	13	57	5	52	29	2	43	8	58	1	39	15	17	4	69				
	End of Month	64	39	26	9	42	34	11	17	29	14	9	57	56	31	39	00	20	48	7	12	25	48	11	4	20	0	3	40	22	7	2	16	19	53	6	44	20	15	5	45			
	Monthly average -	71	38	13	22	50	01	14	54	41	07	13	4	44	52	20	52	25	15	56	4	52	31	54	9	53	21	38	3	50	27	56	8	49	27	7	7	01						
MADRAS.	CALCUTTA.																																											
	1st -	25	49	8	46	15	50	7	31	5	4	1	48	4	20	2	46	8	2	41	1	31	52	30	22	45	3	18	2	15	2	4	0	50	12	17	9	08						
	2nd -	38	29	20	46	9	42	4	54	25	50	6	56	22	08	4	25	10	6	5	23	3	33	11	53	3	45	4	12	3	15	2	17	0	50	3	01	1	20					
	3rd -	17	12	8	4	18	37	5	14	18	1	7	29	3	28	1	13	24	48	12	36	5	43	3	10	2	46	1	28	20	30	15	56	25	41	19	48	5	44	2	15			
	End of Month	4	40	3	30	23	3	13	6	5	29	3	56	27	15	20	33	3	45	1	13	7	54	3	19	20	0	12	24	52	0	1	0	3	35	4	49	2	52					
	Monthly average -	19	2	10	16	16	48	7	41	13	36	5	02	14	18	7	14	11	32	6	18	7	12	2	53	21	47	10	5	20	00	5	36	8	29	6	16	6	28	3	53			
RANGOON.	CALCUTTA.																																											
	1st -	-	-	-	-	84	14	76	43	81	35	64	6	161	5	156	16	118	15	95	30	49	30	30	0	35	15	9	0	94	30	47	30	32	0	25	0	167	37	44	6			
	2nd -	-	35	193	25	247	9	225	44	95	44	89	45	54	19	13	16	15	0	10	0	36	45	24	0	20	0	14	0	58	18	26	19	129	0	11	0	94	27	71	5			
	3rd -	-	48	164	25	174	10	112	-	-	-	-	-	17	41	10	4	120	0	61	30	31	0	14	20	104	40	34	0	163	30	162	0	70	23	59	33	54	13	42	28			
	End of Month	-	52	26	48	44	125	17	49	55	102	2	68	50	-	-	-	275	0	208	0	16	14	11	24	69	30	50	45	23	0	8	0	220	47	116	52	-	-	-	-			
	Monthly average -	169	36	135	31	157	42	116	5	93	07	74	13	77	57	59	52	132	4	98	45	33	22	19	56	57	21	26	56	84	49	60	57	113	2	53	6	105	25	52	47			

TABLE showing the Weekly and Monthly Average Maxima and Minima times of transit of Messages between the undermentioned Stations.

From	To	MAX.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER 1865.		JANUARY 1866.		FEBRUARY.																						
		Maxima.		Minima.		Maxima.		Minima.		Maxima.		Minima.		Maxima.		Minima.		Maxima.		Minima.																						
		Hrs.	Mts.	Hrs.	Mts.	Hrs.	Mts.	Hrs.	Mts.	Hrs.	Mts.	Hrs.	Mts.	Hrs.	Mts.	Hrs.	Mts.	Hrs.	Mts.	Hrs.	Mts.																					
CALCUTTA.	BOMBAY.																																									
	1st -	155	32	10	39	29	11	18	39	55	59	18	46	48	47	23	43	76	24	17	26	15	39	5	13	87	08	15	01	36	24	3	48	54	20	18	20	47	57	8	41	
	8th -	215	25	1	13	42	43	25	23	112	40	18	17	53	32	14	25	30	15	14	34	45	24	1	49	46	58	1	36	32	26	2	17	29	8	5	51	31	16	7	16	
	23rd -	205	49	55	49	40	6	23	19	123	49	1	30	31	9	21	26	44	42	19	25	35	27	2	53	65	54	3	40	54	0	2	25	15	1	50	26	22	1	43		
	16th -	-	-	-	-	41	75	16	06	56	24	7	20	62	17	26	54	17	36	8	55	37	11	13	47	48	13	5	25	28	43	4	8	12	27	1	42	13	06	1	36	
	24th -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Monthly Average }		192	35	22	33	38	18	20	51	87	27	11	27	48	41	21	37	42	14	15	5	55	25	5	62	4	6	25	37	53	3	3	30	17	6	55	29	40	4	49		
MADRAS.	BOMBAY.																																									
	1st -	132	21	96	29	32	29	21	38	88	37	38	00	56	14	18	15	13	57	10	16	21	13	7	01	62	22	55	38	31	12	17	12	31	12	12	24	4	34	1	0	
	8th -	137	29	91	18	34	4	30	47	83	11	50	24	21	54	8	35	12	43	4	23	36	42	22	32	37	30	35	29	20	51	11	17	11	43	7	6	1	34	13	8	48
	16th -	207	49	51	47	1	56	15	28	54	59	33	00	37	8	16	23	14	21	7	33	22	25	14	58	111	10	77	12	26	51	19	43	7	6	1	55	11	00	9	13	
	24th -	-	-	-	-	19	08	14	26	22	38	7	55	48	28	31	04	9	52	7	24	32	38	25	26	43	3	31	00	10	55	6	48	7	22	3	41	12	46	5	32	
	Monthly Average }		159	13	79	51	26	54	20	19	53	21	32	19	40	56	18	34	12	43	7	24	28	29	17	29	63	31	49	49	22	27	13	45	14	20	4	53	10	23	6	23
KURRA-CHEE.	BOMBAY.																																									
	1st -	42	9	3	56	31	21	14	25	92	8	36	43	15	59	6	08	14	04	2	1	19	11	9	14	4	5	0	55	20	0	4	0	5	36	1	48	43	0	31	0	
	8th -	44	29	2	29	17	30	14	28	85	59	23	39	11	9	7	00	19	33	12	08	16	53	1	56	12	16	2	38	8	0	1	8	3	4	2	8	71	22	39	09	
	16th -	13	55	1	57	22	38	21	32	22	15	2	37	40	53	21	46	13	26	9	07	3	4	0	50	7	51	2	57	6	8	1	0	31	0	10	55	18	52	11	19	
	24th -	-	-	-	-	49	41	46	26	47	35	7	46	36	57	16	14	9	15	5	26	9	19	1	51	11	42	9	33	4	34	1	17	49	37	37	59	1	36	0	34	
	Monthly Average }		33	37	2	47	30	17	24	25	62	29	17	41	26	29	12	47	14	17	7	25	12	7	3	27	8	58	4	15	9	40	1	51	22	19	13	12	33	40	20	30

APPENDIX (C.)

GOVERNMENT TELEGRAPH DEPARTMENT.—DEPARTMENTAL ORDERS.

Calcutta, 1st January 1866.

No. 1 of 1866.—The Director General has great pleasure in announcing to the department that the Governor General in Council has been graciously pleased to approve of all his recommendations for improving the efficiency of the Department generally, and has granted a very liberal increase of salaries.

These recommendations, as far as the superior grades are concerned, may be briefly described as measures for removing all extra friction, simplifying and obtaining prompt audit of accounts, and incessant patrolling and supervision of lines and offices.

Superintendents will be vested with the powers and responsibilities of Directors.

With this view the grade of Directors will be abolished, a central office of accounts established, and the following arrangements of establishments will eventually come into force :—

			<i>Rs.</i>		<i>Rs.</i>	<i>Rs.</i>
There will be	4	1st class superintendents	on 1,050,	rising to	1,500,	by 75 annually.
„	6	2nd „	on 800,	„	1,000,	by 50 „
„	9	3rd „	on 600,	„	750,	by 30 „

Eighty-eight assistant superintendents on 200 rupees to 450 rupees, in four grades; their promotion to be by length of good service, irrespective of vacancies.

The same travelling allowances as in the Public Works Department, according to rank. All casual allowances, such as house rent, house accommodation, horse allowance, &c., are to be abolished.

The above sketch of the changes sanctioned is quite sufficient to show that this organization will place the Telegraph Department in a position second to none in India, either as regards present pay, position, and pension.

But the Director General must impress on the attention of every member of the Department that this new scheme has only been sanctioned as an experimental measure, and on the distinct pledge of the Director General that these changes will produce that amendment which is so much desired by all concerned.

The Director General feels confident that every officer of the Department will give him his earnest and hearty co-operation in redeeming this pledge, and that with their aid the Telegraph Department will soon be as remarkable for its efficiency as it has been hitherto unfortunately, and probably unjustly, considered the reverse.

All the covenanted officers of the Department are requested to observe that the abolition of the house allowance will require their consent. Those who prefer the old rates of pay and allowances can of course remain as they are, but all who prefer the new scale of salaries to the old, before being placed on the new scale, must execute a deed releasing the Secretary of State for India from that part of their covenant which stipulates that they shall be provided with house accommodation or money in lieu thereof.

The general measures for improving the position of the signallers are to give them somewhat better pay, better furnished quarters, a uniform, and to allow them to indent on the commissariat for rations. Assistants in charge are to be called Telegraph Masters, and their deputies, Deputy Telegraph Masters.

In view to rewarding the well conducted and intelligent, the charge allowances are to be altered to 80, 60, 40, and 20 rupees, and these allowances are to be personal instead of official, that is to say, the pay of a Telegraph Master, I., II., III., and IV. Grades, will exceed that of Signaller of his standing by the above allowances, wherever he may be. A first-class Telegraph Master would generally hold charge of a first-class office, but not necessarily so. Should he, for convenience of Government, and not as punishment, be sent to a small office, he would still keep the higher salary, and he will also derive all the advantages arising from the increased salary when on leave or pensioned.

The Pay of Signallers is to be regulated according to the following Scale :—

After Years of Service.	CHARACTER.				REMARKS.
	Superior.	Good.	Average.	Indifferent.	
15	195	162	130	100	The years required to serve, before an increase can be given, may be shortened in especially deserving cases.
14	183	152	122	95	
13	171	142	114	89	
12	159	132	106	83	
11	147	122	98	77	
10	135	112	90	71	
9	126	105	84	66	
8	117	97	78	61	
7	108	90	72	57	
6	99	82	66	52	
5	90	75	60	45	
4	84	70	56	42	
3	78	65	52	39	
2	72	60	48	36	
1	66	55	44	33	
0	60	50	40	30	

The Director General very much desires to see the Signallers so comfortable and well located that they will prefer remaining in the offices to wandering in the bazaars, that they may, in fact, feel at home in their offices.

He will, therefore, be much obliged for suggestions, and most happy to afford his support to any practical scheme for forming small libraries, and other simple means of amusement.

D. G. Robinson, Lieutenant Colonel,
Director General of Telegraphs in India.

N.B.—Further details will follow as soon as the Director General receives final orders on the whole scheme. Meanwhile covenanted officers, who desire to be placed on the new scale of pay, should lose no time in executing the deed referred to, which will be forwarded on application.

APPENDIX (D.)

GOVERNMENT TELEGRAPH DEPARTMENT.

Circular No. 73.—New Series.—Calcutta, 2nd March 1866.

The following Tabular Statement of the Tests upon which a Signaller is to be promoted to the Superior and Good Grades is published for general Information.

Education.	Marks.	Proficiency in transmitting and reading Morse Signals.	Marks.	Knowledge of Instruments and Connections.	Marks.	Conduct when on Duty.	Marks.	Departmental Knowledge.	Marks.	General Conduct.	Marks.	Special Service.
Correct reading of printed and manuscript matter - - -	5	Ability to receive and signal not less than ten words per minute from the sounder, and six from the needle. -	8	Ability to prepare batteries, set up and adjust instruments, explain the principle of Translation working, and trace the currents throughout the Office and Instruments, in view to discover by testing the locality of a fault -	20	Steadiness at, and strict attention in, watching the instrument - -	5	Knowledge of the rules of the Department required in the working of an Office - -	15	Regular attendance	5	Perseverance under circumstances of difficulty or hardship in the performance of duty - -
Accurate spelling - -	10									Freedom from Debt	5	
Distinct and neat handwriting - - -	10					Obedience to superiors in the Office and in Stations with which it may be in communication - -	10			General cleanliness and neatness -	5	
Knowledge of Arithmetic up to Rule of Three -	5	Evidence of endeavors to prevent mistakes in transmission of messages, such as asking repetition of any doubtful word, and noting the fact in a foot note - - -	15			Freedom from obstinacy and from the use of intemperate or abusive language - -	10			Morality of conduct	10	
General acquaintance with the Geography of the World and thorough knowledge of that of India - - -	5					Strict compliance with all departmental rules as affecting the transmission of messages - -	5			Mental energy -	5	
Of other Mathematics : Algebra 5, Logarithms 5, Geometry 5, Trigonometry 10, French or Scientific Knowledge 15 - - -	40					Promptness in execution of business - - -	5					
Total under each subject	75		23		20		35		15		30	

Marks to be deducted from the Aggregate.				Totals for non-fulfilment of Requirements and Bad Conduct.				
For every well authenticated case of error or omission through carelessness in reading or transmitting Signals—				For unsteadiness, disobedience, obstinacy, and breach of departmental orders—			For each instance of absence from duty without leave - -	2
In the Superior Grade	3			In the Superior Grade	3		For each instance of late attendance	1
In the Good Grade	2			In the Good Grade	2		Unjustifiable indebtedness -	6
In the Ordinary Grade	1			In the Ordinary Grade	1		Associating with bad characters -	10
							Absence from duty without leave in excess of 24 hours	40
							Keeping bad company - - -	20
							Intemperance -	40

Minima of Marks qualifying for Promotion under each Head.							
To the Superior Grade -	35	To the Superior Grade	20	To the Superior Grade	20	To the Superior Grade	25
To the Good Grade -	25	To the Good Grade	15	To the Good Grade	10	To the Good Grade	20
To the Ordinary Grade -	20	To the Ordinary Grade	12	To the Ordinary Grade	5	To the Ordinary Grade	15
						To the Ordinary Grade - - -	4

Aggregate totals of marks required for promotion to—

Superior	-	-	-	135
Good	-	-	-	97
Ordinary	-	-	-	71

2. No Signaller is to be recommended to the Director General for promotion from the Average to the Good or Superior Grade who has not obtained during the previous six months the minimum number of marks under each head in addition to the minimum total number of marks. Superintendents are at the same time to recommend for reduction Signaller of Good or Superior Grade whose conduct during the previous six months has earned less than 90 marks.

3. Recommendations to be made on 1st January and 1st July annually in the form annexed. The classification of Telegraph Masters and Signallers into the Grades of Superior, Good, Ordinary, and Indifferent is now to be made on the basis of the pay they were in receipt of on the 31st December last for their length of service, i. e., a Signaller of 25 years' service, drawing 120 rupees per mensem, will be entered as in the Superior Grade, whereas another of the same length of service, and drawing only 60 rupees, will be entered as in the Indifferent Grade. From 1st July next, biennial re-adjustments of these Grades will be made on information furnished by the half-yearly Reports and Test Papers.

It will not suffice for a Signaller to gain admission into the Superior Grade to be always in that Grade; he must be steady and continuous in exertion, or bad reports will result in his reduction.

D. G. Robinson, Lieut. Colonel, R.E.
Director General Govt. Telegraphs

APPENDIX (E.)

GOVERNMENT TELEGRAPH DEPARTMENT.

(Circular No. 74.—New Series.)

Calcutta, 5th March 1866.

To prevent Loss of Messages.

On the 6th September 1865 a preliminary circular was issued with the object of checking the loss of messages in transit.

The practice therein ordered has afforded evidence of the loss of several messages, but has not, in the case of the corresponding offices being several days' work apart, effected that saving of time which was contemplated.

The above circular order is, therefore, cancelled, and in lieu thereof, the following will come into force:—

In lieu of the 26 letters of the alphabet only 10 will be used, and as no word can be pronounced without it contains a vowel, combinations of consonants cannot be mistaken for words, and will therefore be employed.

The consonants B, C, G, J, K, L, N, Q, V, Z, will represent 1, 2, 3, 4, 5, 6, 7, 8, 9, 0. D is omitted because it will be used as an abbreviation for decimal, F for the same reason for fraction, H for half of, M because M M M is the signal for a horizontal divisional bar. P for perpendicular bar. S for shillings, R for rupees, as will be hereafter explained.

It is the duty of all to at once learn to distinguish numbers by these letters, but they are on no account to be signalled for figures in the body of a message.

Their use to be limited to the message numbers and to the date. Figures in the body of the message will be signalled as separate words spelt in full in the manner shown hereafter.

All messages will start with a distinguishing number represented by letters, as in the specimen, in which Bombay is the original station, and assuming 255 messages to have been already sent, C K L (256) is the Bombay monthly distinguishing number, which will be telegraphed with the message from place of starting to place of delivery.

In addition to this monthly original number, (defined by letters), every message will have its daily local transit distinguishing numbers, commencing daily at O hours with B or 1 signalled only from one station to the next, the use of which will probably be easiest understood from an example.

Suppose a message despatched from Bombay through Indore and Agra to Calcutta, and every instrument in every office to be supplied with register slips like the specimens appended, one slip for every office with which the instrument ever works.*

The Bombay Telegraph Master being an originator of the message will, after examination, enter on the message and on his sent register the monthly, or through number consecutive for all messages sent from Bombay (C K L), and the local sent number consecutive for all messages sent on one day from Bombay to Indore. In this case G N. As the message emanates from Bombay there will be no received number. The monthly number is inserted after the originating station, Bombay, at the head of the message the "sent to" or local number Indore at the bottom. We have assumed the date to be the 3rd of March C K K, the last original or monthly, and G L the last local number. The telegraph master will then hand the message to the Indore instrument, the signaller at which will despatch it, and then mark it off on his Indore slip on the sent side, finally initial both draft and entry on slip.

On the message being received into the Indore station, the signaller there, who will also have a set of register slips (*vide* specimen 4), one for every office with which his instrument works, will mark off on his *received* register slip, headed Bombay the daily or local number. This local or daily Bombay number will be entered on the message draft after the name of the station received from, Bombay, at the bottom, the time after his own name as usual, and the through number after Bombay at the head as usual.

Having done this, the signaller will send the message to the telegraph master or his deputy for examination. The telegraph master after examining it, will enter on his own received register in the column under Bombay, the through number and the Bombay local number, and in his sent register in the column under Agra, the through number and next consecutive local number for Agra, then place this latter on the message draft and then hand it to the Agra instrument for despatch. In this case we assume C L to be the number next consecutive for Agra, which is entered on the draft after Agra, *vide* specimen. The signaller after despatching the message to Agra will enter the local number on the sent side of his slip, and initial both the slip and the draft. The Agra office will treat

* It will be observed that each of these slips has a *received* side printed *red* for messages received from any one station, and a *sent* side printed *black* for messages sent by that instrument to the same station.

treat it in the same manner and so on into Calcutta. In case of interruption occurring after the message has passed the telegraph master, and prior to despatch, the following will be the treatment:—

Suppose the interruption to be between Indore and Agra, and beyond Seepree. The signaller has only to strike out Agra and its consecutive local numbers, and insert Seepree, and its local consecutive numbers instead, and then to transmit the message to Seepree instead of Agra.

It is evident from the foregoing that if the local numbers received at an instrument or sent from an instrument are not consecutive, there must be a message missing, and that these slips will show where it is, also that the telegraph master can with the greatest facility by means of the slips and the drafts identify which message is missing and call for it. Telegraph masters are particularly to observe that the through number is to be telegraphed right through, but the local numbers only from station to station.

Telegraph masters are carefully further to examine and compare the register slips every two hours, and to call on the rear office to supply any messages missing or information they may require.

The daily transit number will commence afresh at O hours, and to prevent the possibility of the last message sent from an office on any day being lost, the last number forwarded will be signalled as well as B (1) with the first message sent after O hours. The letter of advice is to be discontinued, and message drafts will be sent every third day to Calcutta, as was formerly the case. Instruments, slips, and registers will be sent, when full, to the check office for examination.

In order to make the above rules work perfectly, it is very essential that the *times* in all offices should be identical. The difference of the time of Bombay and Calcutta from Madras time are known in those offices; these are therefore stations from which identical Madras or telegraph time can be transmitted with perfect accuracy, and there can be no excuse for all stations not keeping identical telegraph time. The rule will be for Calcutta, Bombay, and Madras to commence rolling daily at 6.57^h to every station they are in connection with, stations in D and in T will open out and take up the rolling. All the stations in India ought to be rolling by 6.58^h. At 24 hours precisely telegraph time, the officer in charge of the Bombay, Madras, and Calcutta offices will give "stop," the rolling will instantaneously cease, which will give the signal to all offices to stop, and telegraph time will thus be given to each office almost simultaneously. They will then notify each to each the *number of messages* which have passed during the previous 24 hours, which will be further proof if any messages have been lost. Telegraph masters are themselves to superintend this duty, and should there be any messages missing will call for them.

To facilitate the Comparison of Messages.

EACH office will be shortly supplied with a stamp wherewith to stamp *heads of message* drafts, and outside of envelopes with the name of the office and date of message in colours, as follows:

All original or sent will be stamped with	Black.
All transit	Red.
All received (for delivery)	Blue.

When all the drafts of one day have been stamped, they are to be made up in packets; all those from the same booking station being placed in one packet in the order of their booking or through number (letters). These packets will then be folded *down the middle* and placed one on top of the other in alphabetical order, *i. e.*, those from stations whose names commence with *A*, as Agra, Allahabad, above those whose names commence with *B*, as Benares, Bombay, and those latter above those commencing with *C*, as Calcutta, Colombo, and so on.

Each packet will further have the initial letter of the station written in a large character on the outside leaf for the information of the Check Office.

These packets, now in one parcel, are next to be secured by twine and forwarded to the Check Office in *one strong blue cover*.

To prevent Errors in the Transmission of Messages.

To obviate as much as possible the numerous and serious errors which occur in the transmission of numbers, the following rules and code of signals have been introduced:

1st. When numbers are in writing, they are to be signalled precisely as written by the sender.

2nd. When in figures they are to have—

1st. A parenthesis signalled at the commencement and end of each group of figures.

2nd. When integer numbers and the same figure do not occur consecutively in the same group, they are to be signalled each figure separately, thus 1,976 will be signalled (parenthesis) one, nine, seven, six (parenthesis); but when the same figures occur consecutively in two or three places, *e. g.*, 10,000; 1,144, &c., they are to be grouped so as to prevent as much as possible the immediate repetition of the same word, thus, 10,000 is to be signalled (parenthesis) ten thousand

sand (parenthesis), not one, nought, nought, nought, nought; 1,144 will be signalled (parenthesis) eleven forty-four (parenthesis); 14,111 will be signalled (parenthesis) fourteen one hundred and eleven (parenthesis); 22,688 will be signalled (parenthesis) twenty-two six eighty-eight (parenthesis).

3rd. When they are mixed numbers (*e. g.*) $114\frac{5}{8}$ or fractions (*e. g.*) $\frac{17}{11}$, the following code of signals will be used; F will represent fractions, D decimal. In the case above, whole numbers are to be treated precisely as set down for integer numbers, after which F will be given to show that a fraction follows, then the numerator of the fraction followed by bar and then the denominator.

Thus, $19\frac{1}{2}$ will be signalled (parenthesis) nineteen. F (showing the commencement of the fraction) seventeen (bar) twenty (parenthesis). Again, $247\frac{9}{16}$ will be (parenthesis) two, four, seven F nine, bar sixteen (parenthesis).

4th. When shillings and pence are written 12 s. 6 d. and 5 s. $4\frac{3}{4}$ d. S will represent shillings; P perpendicular bar, 12 s. 6 d. will be signalled (parenthesis) twelve S P (perpendicular bar) six (parenthesis). Also 5 s. $4\frac{3}{4}$ d. will be (parenthesis) five S P four F fraction seven bar eight (parenthesis), or 1 s. $11\frac{3}{4}$ d. will be (parenthesis) one S P eleven F seven bar eight (parenthesis), 32 s. $2\frac{1}{2}$ d. will be (parenthesis) three twenty-two S P two F one bar two (parenthesis).

Rupees and annas will be treated in the same manner as shillings and pence, R and A being used instead of S and P.

The fair copies of messages sent out to addressees will have the number written out in the ordinary manner, thus the (parenthesis) twenty-two six eighty-eight (parenthesis) signalled as above, will be written on the fair copy 22,688, and (parenthesis) three twenty-two S P two F one bar two (parenthesis) will be entered (32 s. $2\frac{1}{2}$ d.)

The letters given in the Circular as representing figures will in future be used for signalling meteorological observations instead of those now employed.

The Director General, in issuing these new rules, is quite aware that they entail some slight extra labour and thought, and that the rapidity with which a heavy press of messages will be worked off must be somewhat affected; but the Director General would impress on the signalling staff of the department, that if they desire to earn his approbation they must work on the old maxim "that whatever is worth doing at all is worth doing well;" he will be far better pleased at seeing a diminution in the number of errors than increase in the rapidity of signalling. It is, indeed, not only his wish, but the interest, and for the credit of every member of the Department, that errors should absolutely cease, even though the pains taken to obtain this very desirable end produces some slight diminution in the number of messages transmitted.

(signed) D. G. Robinson, Lieut.-Colonel, R.E.,
Director General of Telegraphs in India.

RETURN showing the Number of Interruptions, and their Average and Aggregate Duration, in each Circle, or Division, for the Years 1862-63, 1863-64, 1864-65, and 1865-66.

	BENGAL.				PUNJAB.				BOMBAY.				EAST COAST OR GANJAM.				CENTRAL INDIA OR NAGPORE.					
	1862-63.	1863-64.	1864-65.	1865-66.		1862-63.	1863-64.	1864-65.	1865-66.		1862-63.	1863-64.	1864-65.	1865-66.		1862-63.	1863-64.	1864-65.	1865-66.			
				From May 1865 to January 1866.	From February to April 1866.				From May 1865 to January 1866.	From February to April 1866.				From May 1865 to January 1866.	From February to April 1866.							
Number of miles comprised in each circle or division.	1,749	1,933½	2,239½	2,239½	1,610	1,811½	1,744½	1,744½	1,744½	1,744½	1,311	1,238	1,216½	1,714½	1,714½	1,015	1,186½	1,102½	1,441½	1,451½	938	
Total number of interruptions in all parts of the circle or division during the year - -	330½	302	*268	183	26	397½	408	511	1	1	1	133	143	137	265	49½	115	122	162	108	286	45½
N.B.—Imperfect communication is considered as =½ interruption																						
Aggregate duration of the above interruptions (duration given in hours.)	8,226	9,521	7,833	6,171	883	10,439	9,210	11,317	Report not received.		2,856½	2,854	4,713½	7,178	895	5,094	3,758	4,750½	2,345	424	13,778	1,384
Proportion of the number of interruptions to the mileage of the circle or division (100 miles being taken as the unit of the mileage).	18.89	15.61	11.96	8.17	1.61	21.94	23.10	29.29	Ditto.		10.74	11.75	7.98	15.45	4.87	9.69	10.17	14.69	13.19	3.11	19.70	4.85
Average duration of each interruption, in hours.	25	31	29	34	34	26	23	22	1	21	20	34	27	18	31	44	31	29	16	16	48	30

* Besides the above number, 25 more interruptions took place during the months of October, November, and December 1864, owing to the damages done to the lines in this division by the cyclone in October 1864. The aggregate duration of these interruptions was 12,204 hours, or an average of 488 hours each.

Appendix (F).—RETURN showing the Number of Interruptions, and their Average and Aggregate Duration, &c.—continued.

	ASSAM.*				MALABAR COAST.*				BANGALORE.*				RAJPOOTANA.*			
	1862-63.	1863-64.	1864-65.	1865-66. From May 1865 to January 1866.	1865-66. From February to April 1866.	1862-63.	1863-64.	1864-65.	1865-66. From May 1865 to January 1866.	1865-66. From February to April 1866.	1862-63.	1863-64.	1864-65.	1865-66. From May 1865 to January 1866.	1865-66. From February to April 1866.	
Number of miles comprised in each circle or division.	1	1	1	1	727	1	1	1	1	991	1	1	1	1	1	807
Total number of interruptions in all parts of the circle or division during the year. <i>N.B.</i> —Imperfect communication is considered as $\frac{1}{2}$ interruption.	1	1	1	1	Report not received.	1	1	1	1	304	1	1	1	1	1	26
Aggregate duration of the above interruptions (duration given in hours).	1	1	1	1	Report not received.	1	1	1	1	763	1	1	1	1	1	719
Proportion of the number of interruptions to the mileage of the circle or division (100 miles being taken as the unit of the mileage).	1	1	1	1	3.07	1	1	1	1	3.07	1	1	1	1	1	322
Average duration of each interruption in hours.	1	1	1	1	25	1	1	1	1	1	1	1	1	1	1	23

* These divisions were formed on the reorganisation of the department in January 1866.

P A P E R S

RELATING TO

ELECTRIC TELEGRAPHS IN INDIA

(*Mr. Ayrton.*)

*Ordered, by The House of Commons, to be Printed,
16 July 1868.*

[*Price 8 d.*]

EAST INDIA (EMPLOYMENT OF NATIVES).

RETURN to an Address of the Honourable The House of Commons,
dated 19 March 1868;—for,

“COPY of any recent DESPATCH from the Secretary of State for *India*, and the recorded OPINIONS of any Member of his Council, relating to the NON-EMPLOYMENT of the NATIVES of *India* in Higher Posts.”

India Office, }
25 March 1868. }

FRANCIS W. PRIDEAUX,
Secretary, Revenue Department.

[Revenue (Foreign), No. 10.]

To His Excellency the Right Honourable the Governor General of India in Council.

Sir,

India Office, London, 8 February 1868.

Para. 1. I HAVE considered in Council the Despatch from your Excellency in Council, numbered 38, Foreign Department, and dated the 13th of September last, with which, in reply to my Revenue (Foreign) Despatch, No. 33, dated the 31st May last, on the expediency of admitting the natives of India to a larger share in the administration of British India, you transmit a copy of the resolution which you passed with the view of effecting the object to which I had directed your attention.

2. I observe with satisfaction that you are “fully alive to the urgent political necessity for opening up to natives of ability and character a more important, dignified, and lucrative sphere of employment in the administration of British India;” and that you are prepared to give at once practical effect to this principle, by recognising the eligibility in the non-regulation provinces of natives thus qualified for grades in the public service, not hitherto open to them.

3. This is a step in the right direction, of which I cordially approve, but it appears to me that there is room for carrying out the principle to a considerable extent in the regulation provinces also. The legislature has determined that the more important and responsible appointments in those provinces shall be administered exclusively by those who are now admitted to the public service solely by competition; but there is a large class of appointments in the regulation, as well as in the non-regulation provinces, some of them scarcely less honourable and lucrative than those reserved by law for the covenanted civil service, to which the natives of India have certainly a preferential claim, but which, as you seem to admit, have, up to this time, been too exclusively conferred upon Europeans. These persons, however competent, not having entered the service by the prescribed channel, can have no claim upon the patronage of the Government, none, at least, that ought to be allowed to over-ride the inherent rights of the natives of the country; and, therefore, while all due consideration should be shown to well-deserving incumbents, both as regards their present position and their promotion, there can be no valid reason why the class of appointments which they now hold should not be filled, in future, by natives of ability and high character.

4. I trust, therefore, that you will be able to provide hereafter higher and better paid employment for natives in the regulation as well as in the non-regulation provinces.

I have, &c.
(signed) *Stafford H. Northcote.*

DISSENT by Sir *Erskine Perry.*

I OBJECT to the Despatch passed on the 31st January last, because, in my opinion, it does not go far enough.

Our attention having been called to the evils which arise from the inability of natives of India to obtain high office under Government, for which they are well fitted, the Secretary of State requested the Governor General to take this important question into careful review.

The Governor General fully admits the urgent political necessity for opening up to natives a more important, dignified, and lucrative sphere of employment under Government than they at present fill; but he confines himself to recommending the non-regulation provinces as the field in which the legitimate ambition of deserving natives may be satisfied.

I respectfully submit that this is an incomplete view of the subject. The non-regulation provinces of India are the most remote, the most backward, the furthest removed of all India from any control by intelligent public opinion. It is obvious that a native of sufficient competence and trustworthiness to administer a high judicial or administrative office in such a province would be at least equally competent in his own Presidency, in the vicinity of the British capital, near his own seat of education, and whence he might derive all the succour and moral support of his educated friends, whether native or English.

The reason given for closing the door to office is, that the law reserves "all higher appointments in regulation provinces for the civil service."

But we are not discussing the law as lawyers; we are asking statesmen to consider what sound policy requires. If the Government of India are of opinion that the natives of India ought not to be excluded by law from employment in their own country, it will be easy enough for the Secretary of State to persuade Parliament to mould the law accordingly.

A Select Committee of this Council reported in 1860 that, although technically all office in India was open to natives, practically they were excluded, and they made strong recommendations for their larger admission to high posts.

I went somewhat further than my colleagues, and beg to append an extract from my views as recorded in the report, as they are completely in point on the present occasion, and as I think they have been confirmed by the subsequent experience of eight years. "One of our members (Sir Erskine Perry) is of opinion that the principle of an exclusive civil service can only be obtained with advantage to the State by giving to the Government larger powers of selection for certain offices to be defined by law than the rest of the Committee think either safe or expedient. For example, in the great practical change recommended unanimously by the Committee, the appointment of natives to higher office under Government, the admission, as a general rule, must depend on public competition and scholarly acquirements. But the young men who will come forward to compete, though not belonging to the lower orders of society, as has sometimes been erroneously suggested, will nevertheless be men who occupy but a humble position in life, and who have received their education at the charge of the State, as Bramins, Kayasts, Purvoes, &c.; they belong to the castes on whom civil government has usually devolved under the soldierly rule of Rajputs and Mussulmans, by whom letters and civil functions were held of little account. If the sons of wealthy talukdars and sirdars could be attracted to our service, the influence which it is seen the old landowning families in India still retain might be made auxiliary to the best purposes of Government. It would be hopeless to expect them at present to come in on competition, but if influential administrators, men like Sir George Clerk or Sir John Lawrence, were enabled to place the sons of chiefs and others in subordinate office, and, on competency being displayed, to promote them to high positions, great advantages might result, and a

positive

positive law which prevents such an arrangement would be an obstacle to good government.

"The same arguments are applicable to the judicial service. It appears from despatches lately received from India, that natives are now training themselves so efficiently for judicial functions by the four-years' course of legal studies now open to them, that steps are urgently recommended to be taken for improving the legal attainments of civilians, so as to remove the inferiority which it is suggested will soon become apparent between themselves and the legally-trained natives."

Yet, by existing law, no legally-trained native, and no English lawyer, however conversant with the country, can be appointed a zillah judge in a regulation province.

What was to have been desired from the Government of India was a statesmanlike survey of the policy of this law; and if it were found that a larger and more liberal entry to the service in India was required, then the whole question of salaries, furlough rules, and other regulations would have to be determined, as of course a native civil service located in their own country would not require the high temptations which are necessary to induce the educated Englishman to undergo expatriation to an ungenial climate.

(signed) *E. Perry.*

8 February 1868.

DISSENT by Sir Bartle Frere.

I CONCUR in much of what Sir Erskine Perry says, and especially in his wish that the Despatch had shown in more detail how much the dealing of the Government of India falls short of what we might have expected from them on this most important subject.

As regards the past, I think any native of India must feel that, even under the present law, much more might be done to employ competent natives in high office, if those who have the distribution and control of patronage were really in earnest in their professions of anxiety to see native agency more extensively used.

Men who have tried it know well that the Government in India has often opportunities of giving high and responsible employment to competent natives of India, and that the bar is as often social or sentimental as legal; in other words, it is a bar which might be overcome if there were a real anxiety to overcome it.

Experience, moreover, often teaches such men that where the bar is a pure technicality, say, in the pay rules, it is not generally dealt with by our Government in a spirit of real anxiety to employ native agency as extensively, and to pay it as liberally, as possible.

Again, I cannot think that the spirit in which the subject is handled in many of the papers forwarded to us by the Government of India, indicates any sense of the only means whereby the great gulf between European and native employés of Government can ever be bridged over.

A rather pompous parade is made of a few crumbs of patronage which can now be thrown to natives; and an opinion is implied, perhaps, rather than expressed, that this is quite as much as natives or their advocates can expect.

But I nowhere find any indication of a belief in the possibility of improving native agency in those points in which we consider it inferior to the agency of Europeans; and in the absence of any belief in the possibility of such improvement, it is hardly to be expected that we should find suggestions for promoting it.

It seems to me not only that such improvement is possible, but that it affords a better chance of attaining the object we have in view than any partial remedy, such as an enlargement of the list of appointments open to natives.

One very simple and easy mode of improving the native service is to give better pay. Something has been done of late years in this way, and with obvious success. But I should have been glad to see the Government of India express a dissent from the common opinion that a lower scale of pay will suffice for natives than for Europeans, the service to be expected being the same in both cases.

I fear that on this point, judging from the concluding sentence of his dissent.

Sir E. Perry does not hold the same view that I do ; but I believe it is a mistake to suppose that for any but ordinary menial service the unavoidable expenses of a native public servant are much less than those of an European.

The personal expenses, such as food and clothing, are, of course, less for a native than for an European ; but there are expenses which, though they cannot be said to be absolutely necessary, are quite unavoidable, *e. g.*, imperative custom throws on a native who can afford it a far heavier burden in supporting his poor relations than custom imposes on an Englishman.

It is easy to say that the tax is self-imposed, but in practice it is quite as imperative as the provision of wine or meat for our European tables.

Again, it is true of much skilled labour requiring special education in India, that the earnings of a native in a subordinate position exceed the salary which Government gives to the European superintendent or head of the department.

This is especially true of the law. A native who is fit to be on the bench can generally make much more by his practice at the bar than he would by his salary on the bench. I have no doubt on this point, having made special and careful inquiry both in Bengal and Bombay ; and it is an important point, because it is in judicial office that there is least inequality between the merits of good native and any but very good European agency.

There are other points more important than those which can be secured by improvement of pay, in which I have no doubt improvement of native agency is very possible : for instance, the feeling of the servants towards the Government they serve. I have no doubt it is very possible to secure a far more complete identification of interests than we generally find at present ; but I do not think the spirit of many of the papers sent to us by the Government of India is likely to promote this object, for I can imagine nothing more galling to a native possessed of any proper feeling, than the self-satisfied supercilious spirit which is occasionally apparent.

I believe it is very possible to do much to Anglicize our native servants, not in manner or costume, nor even necessarily in language, but in feeling ; to make them feel towards our Government, as being *their* Government, *the* Government to which they belong, and which belongs to them, and the best possible Government for India. The feeling may never rise to exactly the kind of loyalty which is felt for a sovereign of the same race and religion as the subject ; but it might be an identification of interest and feeling, which is rare now, and is daily, I fear, becoming rarer.

(signed) H. B. E. Frere.

18 February 1868.

EAST INDIA (EMPLOYMENT OF NATIVES).

COPY of a DESPATCH from the Secretary of State for *India*, dated 8 February 1868, and the recorded OPINIONS of any Member of his Council, relating to the NON-EMPLOYMENT of the NATIVES of *India* in Higher Posts.

(*Mr. Otway.*)

*Ordered, by The House of Commons, to be Printed,
26 March 1868.*

178.

Under 1 oz.

EAST INDIA (ENGINEERS' ESTABLISHMENT, &c.)

RETURN to an Address of the Honourable The House of Commons,
dated 30 July 1867;—for,

“RETURN of the Names of the EXAMINERS appointed to examine the CANDIDATES who presented themselves, since last Return, for Admission to the ENGINEERS' ESTABLISHMENT and PUBLIC WORKS DEPARTMENT of India:”

“And, of the Names of the SUCCESSFUL CANDIDATES in Order of Merit, their Ages, Place of Education, the Names of the CIVIL ENGINEERS, if any, to whom such Candidates have been Articled Pupils; the MARKS assigned to every Candidate on each Subject; and the EXAMINATION PAPERS on each Subject (in continuation of Parliamentary Paper, No. 454, of Session 1866).”

India Office, }
1 August 1867. }

CLEMENTS R. MARKHAM,
Assistant Secretary, Public Works Department.

CIVIL ENGINEER EXAMINATIONS.

NAMES OF EXAMINERS.

Rev. Jonathan Cape, A.M., F.R.S.
Lieut. Col. C. D. Newmarch, R.E.
George Preston White, Esq., C.E.

SUCCESSFUL CANDIDATES in order of Merit.

NAME.	AGE.	Engineer to whom Articled, or under whom Served.	Place of Education.
1. Mr. P. Maitland -	23	J. S. Peirce, C.E., Westminster.	King's College, London.
2. „ T. Higham -	19	W. Martley, M.E., London, and T. J. Hay, C.E., Westminster.	King's College, London.
3. „ H. Joll - -	22	R. P. Brereton, C.E., Westminster.	Not stated.
4. „ E. W. Oates -	21	C. L. Light, C.E., London -	Rev. J. Back, Hanwell.
5. „ J. F. Mackenzie	19	J. Mackenzie, C. & M.E.; G. Bertram, M.E.; Edinburgh.	Dollar Institution.
6. „ W. B. Bromley	21	Peto & Betts, C.E.; G. Berkeley, C.E.; Westminster.	King's College, London.
7. „ J. Stewart -	22	J. Stewart, C.E., Edinburgh -	Not stated.
8. „ T. E. Ivens -	22	J. Rennie, C.E., London -	Madras College, St. Andrew's.
9. „ J. S. Beresford	22	Roderick Gray, C.E., Enniskillen.	Queen's College, Belfast.
10. „ A. Grant -	18	H. H. MacLure, C.E., Glasgow	Dollar Institution.
11. „ T. Beatty -	22	R. Young, C.E., Belfast -	Queen's College, Belfast.
12. „ J. Heinig -	21	Sir C. Fox & Sons, C.E., London.	King's College, London.

2 PAPERS RELATING TO EXAMINATION OF CANDIDATES FOR

SUCCESSFUL CANDIDATES in order of Merit—*continued.*

NAME.	AGE.	Engineer to whom Articled, or under whom Served.	Place of Education.
13. Mr. E. G. Davies -	18	J. N. Butler, C. E., Dunmow -	Dollar Institution.
14. „ W. G. Strype -	20	T. Grendon & Co., M. E., Drogheda.	Not stated.
15. „ F. W. Stevens -	20	C. E. Davis, C. E., Bath -	Bath School of Art.
16. „ A. W. De Crettes	21	J. C. Burne, C. E., Dublin -	Not stated.
17. „ D. Wallace -	19	J. Sang, C. E., Kirkaldy -	Madras College, St. Andrew's.
18. „ R. Ring -	20	J. L. Howell, C. E., London -	Queen's College, Cork.
19. „ D. Noyes -	20	G. W. Hemans, C. E., Westminster.	Not stated.
20. „ H. B. Parry -	21	Jenkin & Trathan, C. E., Liskeard.	Not stated.
21. „ R. W. Norris -	21	G. W. Hemans, C. E., Westminster.	Not stated.
22. „ G. D. Wybrow	22	Parr, Curtis & Madelay, M. E., Manchester.	College, Chester.
23. „ C. J. Peters -	19	J. C. Craven, M. E., Brighton	Madras College, St. Andrew's.
24. „ D. Rutherford -	23	J. Bell, C. E., N. B. Railway, Ireland.	Dollar Institution.
25. „ J. Tate -	18	A. Tate, C. E., Belfast.	Queen's College, Belfast.

NUMBER of MARKS assigned to each Candidate.

	Mathematics.	Civil Engineering.	Surveying.	TOTAL.		Mathematics.	Civil Engineering.	Surveying.	TOTAL.
1	298	335	150	783	22	200	325	100	625
2	276	330	173	779	23	213	265	132	610
3	230	335	180	745	24	205	285	110	600
4	250	335	155	740	25	215	235	150	600
5	280	295	164	739	26	170	260	176	606
6	235	335	163	733	27	128	335	140	603
7	219	330	174	723	28	146	330	122	598
8	233	325	160	718	29	122	330	128	580
9	239	325	150	714	30	216	235	127	578
10	205	295	193	693	31	248	220	104	572
11	201	330	152	683	32	151	320	100	571
12	205	330	144	679	33	203	255	104	562
13	204	320	145	669	34	211	225	115	551
14	201	320	140	661	35	202	245	100	547
15	202	330	128	660	36	138	285	110	533
16	200	320	138	658	37	207	230	68	505
17	261	240	144	645	38	178	230	63	471
18	235	255	150	640	39	130	275	50	455
19	223	300	116	639	40	82	235	100	417
20	200	325	104	629	41	90	240	68	398
21	201	315	110	626	42	68	235	54	357

PUBLIC WORKS DEPARTMENT—INDIA.

CIVIL ENGINEER ESTABLISHMENT.

EXAMINATION PAPERS FOR APPOINTMENTS for July 1867.

EXAMINATION PAPERS for Competitive Examination of Candidates for Appointments in the Engineer Establishment of the Department of Public Works in India, held at the India Office, London, in July 1867.

George Preston White, C.E., Examiner.

Candidates are particularly requested to attend to the following Directions :

1. Prefix the number of the question to each answer.
 2. Write legibly, and answer the questions as concisely as possible.
 3. Use free-hand sketches or diagrams wherever possible, to illustrate the answer, which must be carefully executed, in order to show the Candidate's proficiency in this style of drawing.
 4. Candidates must not, during the Examination, refer to any Book or MS., nor communicate with each other.
 5. Candidates are required to produce *bond fide* finished drawings, with certificate, respecting which there will be a *viva voce* examination.
-

Describe the course of education you have undergone, name the Engineer to whom you have been a pupil, the number of years articted, the nature of the works on which you have been engaged, and state in what branch of the profession you have had most practical experience.

ON WATER SUPPLY, RESERVOIRS, DAMS, &c.

1. Describe briefly the different means employed to supply towns with water, and give illustrative examples.
2. Describe the gravitation and pumping systems, pointing out their comparative advantages, and state the principal conditions and requirements to be considered and attended to in adopting either system.
3. Describe briefly what are impounding, compensating, depositing, storage and service reservoirs, residuum lodges, and collecting grounds,
4. Describe the geological formations which are the best water-bearing strata, and explain why the flow of water is generally more regular through the chalk than through the clay formation.
5. In constructing dams for impounding water, specify the precautions which should be adopted for security, and to render them impervious to water; and specify the difference between the forms of construction employed in this country and France.
6. Describe some of the most approved means for forming filter beds, as for example at the Lambeth, York, Chelsea, and other Waterworks, as first introduced by Mr. Simpson, C. E.; specify the best materials to employ for the purpose, and explain whether the action is chemical or mechanical, and what head of water is necessary.

4 PAPERS RELATING TO EXAMINATION OF CANDIDATES FOR

7. If employed to supply a town with water, state some of the principal conditions which would guide you as to the mode of supply; how you would ascertain the probable amount of supply, the quality of the water, and the number of gallons per day, on the average, it would be desirable to provide for per head of population.

8. Make a free-hand sketch to illustrate the most approved forms for cast-iron water pipes; describe the different means used for jointing pipes, pointing out the advantages or defects of each system. What are turned and bored joints, and specify when they are particularly applicable?

9. In preparing a specification for cast-iron pipes, explain why it is desirable that large pipes should be cast perpendicularly with the faucet end downwards. Also as to the nature of the material which should be employed to cast them in, the quality of the metal, and the mixtures most approved; and describe how the pipes should be tested to ascertain their strength and freedom from laps, air holes, or other imperfections.

ON PUMPING ENGINES, &c.

10. To how many atmospheres of pressure would it be desirable to test water pipes, as compared with the head of water to which they would be actually subjected in practice? And when under pressure what further test is then desirable?

11. Illustrate with free-hand sketches and describe the uses of the following; viz., bib cocks, crutch key cocks, spigot and faucet joints, flange joints, stand pipes, reducing pipes, branches and bends, air vessels, scour cocks, hydrants, sluice valves.

12. Calculate the number of gallons of water which a pipe 30 inches diameter is capable of delivering in 24 hours, with a fall of 20 feet per mile.

13. Describe briefly the different kinds of pumps and other contrivances for raising water; give a free-hand sketch of a bucket and plunger pump, with its suction and delivery valves, and state under what circumstances centrifugal pumps are most applicable.

14. Describe the mode of ascertaining the power of pumping engines required in any given case, supposing the quantity of water to be delivered per hour, size and length of main, and difference of level between the water in pump well and top of stand pipe or service reservoir, be given.

15. The following is a practical application of the foregoing question:—It is required to construct pumping machinery, consisting of two engines, two pumps, and two boilers, capable together of forcing 50,000 gallons of water per hour through 3,600 yards of 12-inch main, and into a reservoir 370 feet above level of water supply. How would you determine the dimensions of the principal parts of the machinery?

16. Calculate head due to friction in preceding question.

17. Having ascertained head due to friction, which, if unable to give the formula for, assume at 36 feet, making a total lift of 406 feet, calculate the net horse power required, taking a horse power at 33,000 lbs. raised 1 foot high per minute.

18. Having ascertained the net horse power, and added thereto 20 per cent. to obtain the indicated horse power, what would be the diameter of cylinder required, supposing 40 lbs. of steam in boiler, and an expansion, say at half-stroke, assuming 30 lbs. mean average pressure per square inch of piston during stroke, length of stroke being 3 feet, and number of revolutions 30 per minute?

19. Supposing a bucket and plunger pump to be used, with stroke of 30 inches, and 30 strokes per minute, calculate diameter of bucket or pump barrel for delivering each 25,000 gallons per hour, bearing in mind that there are 277 cubic inches to a gallon.

20. Assumin

20. Assuming that at the pressure of 40 lbs. in boiler the relative volume of steam to water is at 640 to 1, calculate the number of cubic feet of water consumed per hour in each boiler.

21. Assuming that 22 square feet of heating surface of boiler is required for evaporating a cubic foot of water, and that a single flued Cornish boiler, shell 6 feet diameter, with flue 3 feet 6 inches diameter, be supplied for each engine, calculate the length of boiler required.

22. Make free-hand sketches and describe the rain gauge and hygrometer, and explain their uses for engineering purposes.

23. Describe the wrought-iron tube employed by Mr. Simpson, C. E., for the Bristol Waterworks, for continuing the aqueduct across the Combe or Ravine; explain the arrangements to provide for expansion and contraction, and also to prevent leakage at the points of junction with the stone aqueduct.

24. Give the names of standard works of reference on the subject of water supply, and name, as examples, some of the principal works which have been executed in this country and abroad for the supply of cities with water.

ON HARBOURS, DOCKS, GROINS, &c.

The accompanying plan represents a harbour, possessing considerable natural advantages, but requiring certain engineering works to render it suitable for the purposes of commerce and navigation.

1. If professionally employed to make a report on this harbour as to its capabilities, and as to the works necessary to render it suitable for a naval station and harbour of refuge, state how you would proceed to make the necessary surveys, take soundings and reduce them to a common datum, ascertain the nature of the bottom, and whether affording good anchorage, and also the direction of the prevailing currents, &c.

2. It will be seen that several rivers flow into the harbour; describe how you would gauge them, ascertain the volume of water discharged, the drainage area, and the amount of solid matter either held for a time in solution or finally deposited.

3. There is a tendency to silt up at the head of the harbour; explain the usual cause of this, and how you would avail yourself of back-water or tidal-water to counteract this deposition, and describe the means adopted for this purpose by Smeaton at Ramsgate, or any other well-known example.

4. Should it appear on investigation that in particular states of the wind or tide additional shelter is required in the outer harbour, mark on chart the position where you would recommend a breakwater to effect this object; give a cross section of it, showing sea slope or face, and specify how you would make the foundations, and the character of the masonry you would recommend for the purpose. Explain the nature of "pierre perdue" foundations.

5. Specify the character of the lime you would employ for the submarine portion of the work; and in the event of not being able to obtain, conveniently, natural hydraulic lime, explain how artificial hydraulic lime could be produced according to the experiments of Sir Charles Pasley and M. Vicat; describe the chemical difference between ordinary and hydraulic lime. In what time should good hydraulic lime set and harden?

6. If found necessary to remove some of the rocks in the harbour, dangerous to the navigation, describe the different means employed for the purpose, and if too large to be dealt with in this way, make a free-hand sketch of a simple form of beacon. If required to lay down permanent moorings, describe the Mitchell and mushroom anchor, and other forms in use.

BANTRY BAY
WITH GLENCARRIFF HARBOUR
SURVEYED FOR THE ADMIRALTY BY
Commanders James Wolfe and William Church, R. N.

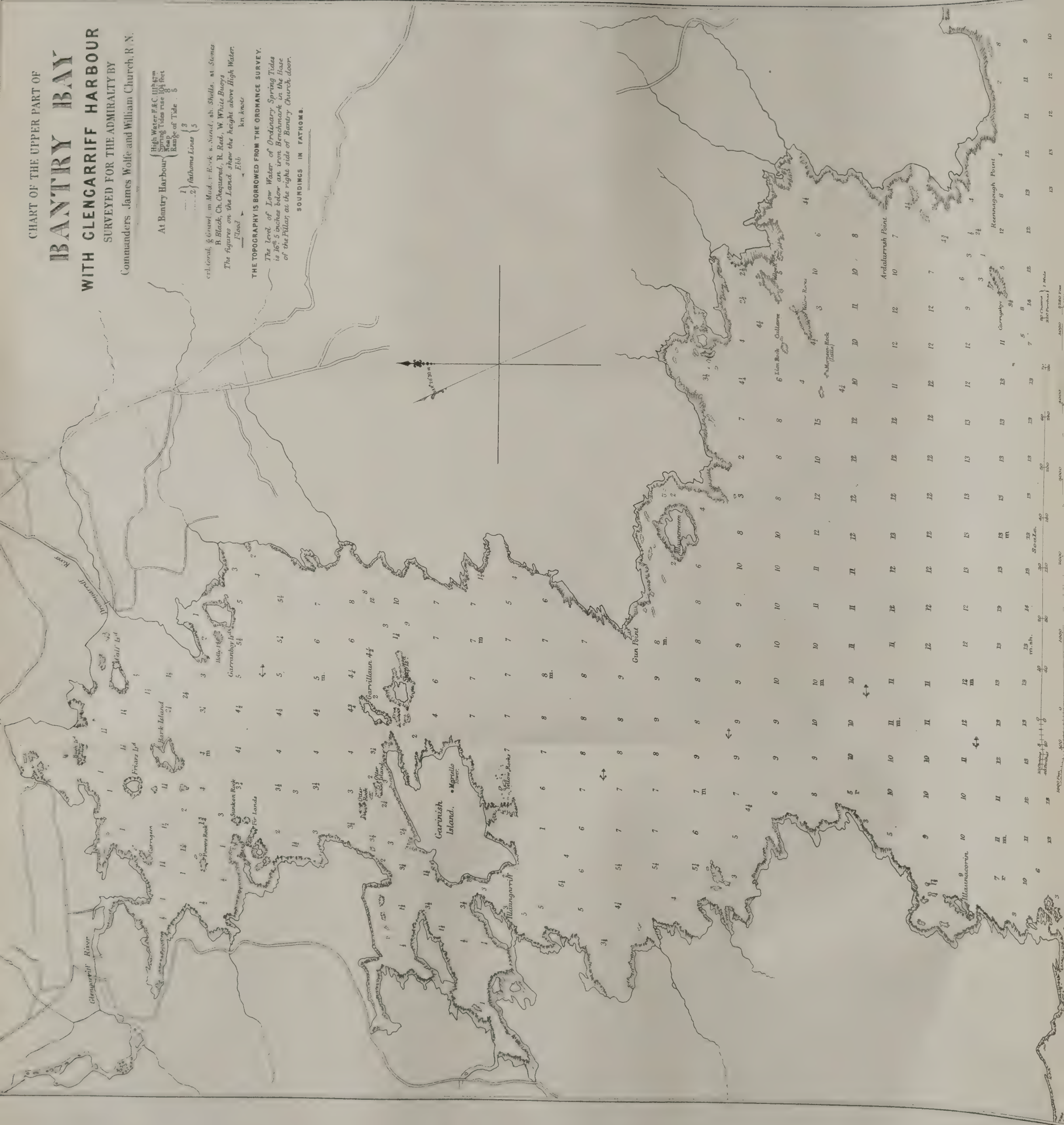
At Bantry Harbour { High Water 48 C. 14 ft 10 in
Low Water 38 C. 10 ft 10 in
Range of Tides 10
..... 2 } fathoms Lines { 3
..... 1 } 5

well, corals, & gravel, in Mud, & Rocks is Sand, & Shells, at Stones
B. Black, Ch. Chequered, R. Red, W. White Buoy
The figures on the Land show the height above High Water:
Flood 256 kn knots

THE TOPOGRAPHY IS BORROWED FROM THE ORDNANCE SURVEY.

The level of Low Water of Ordinary Spring Tides is 16th 5 inches below an iron Benchmark in the base of the Pillar, at the right side of Bantry Church door.

SOUNDINGS IN FATHOMS.



6 PAPERS RELATING TO EXAMINATION OF CANDIDATES FOR

7. One of the first requirements will be the formation of docks, quays, and landing stages. Mark on accompanying map where you would place them, showing position of locks and entrance gates.

8. It frequently occurs, as along the south-east coast of England, that there is a movement of shingle, sand, or other material, which deposits itself at the entrance of harbours, and proves most detrimental; describe some of the means employed to arrest this, and explain the use of wave traps and beaching basins, and give some examples.

9. It will also be necessary to establish lighthouses and beacons. Mark on the map the position you would place them in; state the chief conditions which would guide you as to the height of lighthouse, and the nature of the lights you would employ, whether fixed, revolving, coloured, or with flashes at intervals.

10. If a landing stage should be required, give a free-hand sketch of a simple form of one, and describe those at Liverpool, or any other well-known or important examples.

11. Having laid out the breakwater and other works included in the foregoing questions, point out what you consider will be the probable effect (if any) in altering the existing conditions of the harbour as to the currents and the deposition of mud and silt, or other material, &c., &c.

12. The Railway Commissioners recommended in their report that a railway should be carried over Garinish Island and across the harbour at the narrow entrance by a viaduct, where there is 60 feet of water. Point out the engineering difficulties and disadvantages of such a line, and mark on map where you consider the best route for a railway, making the embankment subservient for docks and other purposes.

13. Give the names of standard works of reference and reports on the subject of harbour engineering, and the names of some of the engineers who have specially distinguished themselves in this most important branch of the profession.

ON LIGHTHOUSES, PIERS, AND MISCELLANEOUS SUBJECTS.

* See Design opposite.
No. 1.

1. The accompanying design* represents a simple form of lighthouse, 60 feet in height, suitable in cases where building materials are deficient, skilled labour expensive or not obtainable, or where there is a difficulty in forming foundations. It is intended to erect this structure on a sand bank, and found it on Mitchell's screw piles. Describe how you would get the piles into position, what depth it would be desirable to go to in sand or alluvial deposit, the size of pile, and diameter of screw. Make free-hand sketches of the piles, screw, braces, &c., showing the means of securing the work together. Give an approximate estimate of the cost of such a structure, exclusive of lantern, and name some successful examples of structures of this character which have been erected either in this country or abroad.

† See Design opposite.
No. 2.

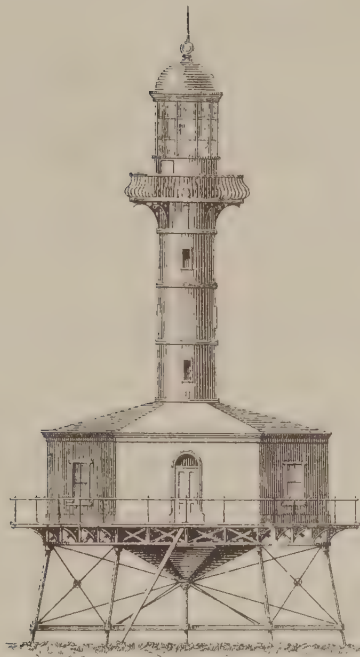
2. The accompanying design† represents a simple form of iron pier with T head, suitable in cases where there is a difficulty in obtaining a good foundation for structures of the ordinary character, or where suitable building materials or skilled labour cannot easily be obtained. Make free-hand sketches to illustrate the details of the work. Describe the form and material of the screw, the mode of manufacturing solid iron piles, the means of getting them into position, what batter it would be desirable to give, and the mode of bracing together the beams, girders and other parts of the work.

3. What are the comparative advantages of the hollow cast-iron pile and the solid wrought-iron pile? Explain the mode usually adopted for getting the former into position.

4. Give the names of any important examples of structures of this kind which have been erected either in this country or in India.

5. Describe

N^o 1.



N^o 2.



5. Describe the effect of sea-water on iron, and specify what steps should be taken as a prevention to injury.

6. Describe and make free-hand sketches of the following forms of wrought-iron girders: the trellis, the warren, the tubular, and the Brunel girder. Specify which form would be most desirable for India, taking into consideration expense of carriage, facility of erection, or where skilled labour was either expensive or difficult to obtain, and describe which of the above forms require staging to get them into position, and what forms can, under certain conditions, be erected without staging.

7. Describe and make free-hand illustrations of some of the most approved modes for scarfing and trussing timber.

8. Name the different kinds of stone employed in building under the following heads, viz., siliceous, argillaceous, calcareous, stratified and unstratified.

9. Describe with free-hand illustration, the means adopted in the main sewers for the drainage of London, to provide for storm-water, and to prevent sewers from blowing up.

10. Describe and make free-hand illustration of the weirs employed at the Manchester Waterworks to separate the storm and turbid water from that suited for the town supply.

11. Illustrate with free-hand sketches, and give the meaning of the following terms: facing point, falling point, blind siding, back shunt, chock block; and state what are the objections to facing points.

12. Photography, for the purpose of making "Photographic Reports," to illustrate the progress of works, copying drawings, &c., is most valuable for engineering purposes, especially in India; attention is therefore directed to the subject. State if you are able to use photography for this purpose.

Note.—On the present occasion I have specially directed attention to the subject of water supply and harbour engineering, two of the most important, but at the same time difficult branches of the profession, and which are yearly becoming more necessary in India, only a few of the principal cities being at present supplied with water; much, therefore, remains to be done in this way. Whilst, as regards harbour engineering, a wide field presents itself, as India, considering her extensive seaboard, is very deficient in natural harbours. I would, therefore, suggest these subjects as being deserving of especial attention.

The President of the Institution of Civil Engineers, in his recent admirable address, has truly remarked, that "The dock and harbour engineer requires the general, and much of the special knowledge of the railway engineer, such as that which belongs to railways and tramways, and warehouses for goods; and to this he must add a vast amount of other special knowledge not required by the railway engineer."

"For example, he must understand the laws which govern the ebb and flow of the tides, the rise and fall, and time of high and low water; and he must have a knowledge of marine surveying, or the best means of ascertaining the set and speed of currents, and their tendency to increase depth of water by scour, or to diminish it by silting; he must also know, in the case of docks, what kind and extent of entrance accommodation to provide, whether the general plan should comprise only a simple lock, or be combined with a half-tide basin; whether single or double gates should be used; and whether it would be necessary to have a tidal basin or a recessed space, or both.

"The nature of the trade to be accommodated in the proposed docks must also be carefully ascertained, in order to provide a proper proportion of quay space and water space, and proper width of quays, warehouses for bonding or for goods to be deposited, sheds for temporary protection, entrance for barges into warehouses from the docks, graving docks and workshops, with mechanical appliances for gates, sluices, and pumping; and for shipping or discharging minerals or goods.

"He may have to deal with solid foundation, and enjoy a facility of procuring suitable materials for construction, as at Liverpool; or he may have the bad foundations of Hull, and other places, where alluvial silt of great depth has accumulated. It may be that good sound stone is too costly for the mass of his work, and that he must resort to brickwork, or rubble stonework, or concrete, or to a combination of all three; but in determining such questions, it is impossible that anything but previous experience and habits of careful investigation will enable an engineer to arrive at the best decision. For it is not enough that his work should be solid, permanent, and safe, but it should be rendered so at the smallest possible cost.

"The dock and harbour engineer is also required to report upon, and to construct, harbours of refuge, piers, landing stages, lighthouses, forts, canals, and their appliances, river improvements and many other hydraulic works; and in short, of this branch of engineering it may be truly said, that questions are continually arising which require special study and mechanical invention to a greater extent than in almost any other branch of the profession."

July 1867.

EUCLID.—Rev. J. Cape.

1. Define the terms *superficies*, *circle*, *scalene triangle*, and *parallelogram*; and state what is meant by a straight line being at right angles to another straight line.

2. If two angles of a triangle be equal to one another, the sides also which subtend or are opposite to the equal angles, shall be equal to one another.

In a triangle, if the lines bisecting the angles at the base be equal, the triangle is isosceles, and the angle contained by the bisecting lines, is equal to an external angle at the base of the triangle.

3. To bisect a given finite straight line, that is, to divide it into two equal parts.

Shew how to trisect—(1) a right angle; (2) one-fourth of a right angle.

4. The opposite sides and angles of parallelograms are equal to one another, and the diameter bisects them, that is, divides them into two equal parts.

If in the diagonal of a parallelogram any two points be taken equi-distant from its extremities, and joined with the opposite angles, a figure will be formed which is a parallelogram.

5. If the square described upon one of the sides of a triangle, be equal to the squares described upon the other two sides of it; the angle contained by these two sides is a right angle.

If from the vertex of a plane triangle a perpendicular is let fall on the base, or the base produced, the difference of the squares on the sides is equal to the difference of the squares on the segments of the base.

6. The angle at the centre of a circle is double of the angle at the circumference upon the same base, that is, upon the same part of the circumference.

7. In a circle, the angle in a semicircle is a right angle; but the angle in a segment greater than a semicircle, is less than a right angle; and the angle in a segment less than a semicircle, is greater than a right angle.

8. To describe an isosceles triangle, having each of the angles at the base double of the third angle.

Let ABD be the isosceles triangle, A the vertex, C the point in which AB is divided. If in the base BD , DE be taken equal to BC , prove—(1) that the rectangle contained by BE and BD is equal to the square on DE ; (2) that CE is parallel to AD .

9. The sides about the equal angles of equiangular triangles are proportionals; and those which are opposite to the equal angles are homologous sides, that is, are the antecedents or consequents of the ratios.

An angle ACB of a triangle is bisected by the line CD , which cuts the base AB in D . If E be a point in AB produced such that EC is equal to ED , prove that BE , DE , AE are in continued proportion.

10. If two straight lines meeting one another be parallel to two others that meet one another, and are not in the same plane with the first two, the first two and the other two shall contain equal angles.

July 1867.

ALGEBRA.—Rev. J. Cape.

1. Reduce to their simplest forms :—

$$\frac{x^3 + 3ax^2 + 3a^2x + a^3}{x^6 - 3a^2x^4 + 3a^4x^2 - a^6} \dots\dots\dots (1)$$

$$\frac{x^4 - xy(x^2 + y^2) + y^4}{x^4 - xy(3x^2 - 4xy + 3y^2) + y^4} \dots\dots\dots (2)$$

$$\frac{\sqrt[3]{a^4} + \sqrt[3]{a^2b^2} + \sqrt[3]{a^3b}}{\sqrt[3]{a^4} + \sqrt[3]{a^2b^2} + \sqrt[3]{b^4}} \dots\dots\dots (3)$$

2. Shew that $\frac{a^2 - (b - c)^2}{(a + c)^2 - b^2} + \frac{b^2 - (c - a)^2}{(a + b)^2 - c^2} + \frac{c^2 - (a - b)^2}{(b + c)^2 - a^2} = 1$.

Also that $(x + y + z)^3 - (x^3 + y^3 + z^3) = 3(x + y)(x + z)(y + z)$.

3. Solve the following equations :—

$$\frac{2x + 25}{13} + \frac{30 - x}{8} = \frac{10x - 327}{19} \dots\dots\dots (1)$$

$$(x - 3)(x - 2) + (x - 3)(x - 1) + (x - 2)(x - 1) = 2 \dots\dots\dots (2)$$

$$\left. \begin{aligned} (ax + by)^2 + (ay - bx)^2 &= 2 \left(\frac{a}{b} + \frac{b}{a} \right)^2 \\ \frac{x}{y} + \frac{y}{x} &= 2 \frac{a^2 + b^2}{a^2 - b^2} \end{aligned} \right\} \dots\dots\dots (3)$$

$$x(x + 1) + 3\sqrt{2x^2 + 6x + 5} = 25 - 2x \dots\dots\dots (4)$$

$$xyz = 231, \quad xyw = 420, \quad xzw = 660, \quad yzw = 1540 \dots\dots\dots (5)$$

4. Extract the square root of $\frac{1051}{25}x^2 - \frac{6}{5}x - \frac{14}{5}x^3 + 9 + 49x^4$; also, of $41 - 12\sqrt{5}$; and simplify $\frac{\sqrt{18a^6b^3} + \sqrt{50a^3b^5}}{\sqrt{8ab^3} + \sqrt{2a^3b - 8a^2b^2 + 8ab^3}}$.

5. If $a : b :: c : d$,

$$\text{shew that } \frac{4a + 5b}{3a - 7b} = \frac{4c + 5d}{3c - 7d}$$

6. Find the series in Arithmetical Progression in which the 5th and 9th terms are 11 and 9 respectively.

7. Sum the following series :

$$\frac{5}{7} + \frac{2}{9} - \frac{17}{63} + \dots\dots\dots \text{to 99 terms} \dots\dots\dots (1)$$

$$\frac{1}{5} - \frac{2}{15} + \frac{4}{45} + \dots\dots\dots \text{to 7 terms} \dots\dots\dots (2)$$

$$\frac{1}{3} + \frac{3}{9} + \frac{5}{27} + \dots\dots\dots \text{to infinity} \dots\dots\dots (3)$$

8. Find the middle term of $(a^{\frac{1}{2}} + b^{\frac{1}{3}})^{10}$, and the two middle terms of $(a^3 - 3a^2b)^{13}$; also, expand $\frac{3a}{(ax - x^2)^{\frac{1}{2}}}$ to five terms.

9. A rectangular area of 8 acres, 480 yards, has a perimeter of 840 yards. Find its length and breadth.

10. Goods are marked for a sale at a price which gives a profit of n per cent. on the selling price, and $(n + 50)$ per cent. on the cost price. Find n .

25. B 11. A man

11. A man has 4 hours at his disposal. How far may he ride in a coach travelling 10 miles an hour, so that he may be able to walk back in time, his rate of walking being 4 miles an hour?

12. The rent of a farm is paid in a certain fixed number of quarters of wheat and barley. When wheat is at 55s. and barley at 33s. per quarter, the portions of rent by wheat and barley are equal; but when wheat is at 65s. and barley at 41s. per quarter, the rent is increased by 7*l*. What is the corn-rent?

July 1867.

MECHANICS and HYDROSTATICS.—Rev. J. Cape.

1. If two forces acting on a point are represented in magnitude and direction by two straight lines, prove that their resultant is represented in magnitude and direction by the diagonal of the parallelogram of which those two lines are the sides.

Two forces, represented by 7 and 9 acting on a point, are inclined to one another at an angle of 60°. Find the magnitude of their resultant.

2. A boy weighing 96 pounds sits on a gate 4 feet from the post on which the gate hangs by hinges, one 3 feet above the other. Find the additional horizontal pressure which he causes on the hinges.

3. On a uniform straight lever weighing 7 lbs., and 7 feet in length, weights of 1, 2, 3, 4, 5, 6 lbs. are hung at distances 1, 2, 3, 4, 5, 6 feet respectively from the extremity. Find the position of the fulcrum on which the lever will balance.

4. Find the relation that the power bears to the weight in the following machines:

- (1.) The system of pulleys in which the same rope passes round all the pulleys, the weight of the pulleys being neglected.
- (2.) The wedge without friction.
- (3.) The inclined plane with friction, the power being inclined at an angle α to the inclined plane.

5. A weight of 500 pounds is placed on an inclined plane, the angle of inclination being 45°, and the coefficient of friction being $\frac{1}{\sqrt{3}}$. Find the least force which will keep the weight from sliding down the plane, and the least force which will draw it up the plane.

6. A line is drawn parallel to the base of a triangle, and cutting off a triangular piece, the area of which is $\frac{1}{4}$ of the area of the whole triangle. Find the position of the centre of gravity of the remaining trapezium.

7. What is meant by the Mechanical terms—*Work*, *Unit of Work*, *Friction*, *Modulus*, *Horse Power*?

8. A train weighs 75 tons, and the friction is 7 pounds per ton. What horse-power must an engine be to draw it up an incline of 1 in 250, at a uniform rate of 24 miles an hour?

9. A shaft, 12 feet in diameter, is to be sunk 130 fathoms through chalk, S. G. 2.315). How long will a two-horse-power engine take to raise the earth excavated, being kept at work nine hours a day?

10. When a body is moving under the influence of a uniform accelerating force, show that $s = \frac{1}{2}ft^2$.

Ex.—The Monument is 210 feet high; how long would a stone take in falling from the top to the ground?

11. Explain

11. Explain how the heights of mountains and depths of mines may be calculated by means of the pendulum.

Ex.—If a pendulum, when carried to the top of a mountain, loses in 24 hours twice as much as it does in the same time when taken to the bottom of a mine close by, show that the height of the mountain is the same as the depth of the mine.

12. With what velocity, and at what elevation, must a stone be thrown to hit the ground at a distance of 375 yards in 11 seconds, the resistance of the air not being taken into consideration?

13. Describe the Hydraulic Ram, and state the defects and advantages attending its use.

14. What weight will an empty 96-gallon cask support in water, the weight of the cask being 52 pounds, and 8 cubic feet of wood being used in making it

15. What must at least be the size, in cubic feet, of an inflated balloon, that it may be able to rise in the air when inflated with gas, whose specific gravity, compared with air, is .09, the weight of a cubic inch of air being .3 grains, and the balloon, car, and contents weighing 750 pounds?

July 1867.

ARITHMETIC, TRIGONOMETRY, and MENSURATION.—Rev. J. Cape.

1. Reduce $\frac{\frac{2}{3} - \frac{2}{9} + \frac{52}{81}}{\frac{4}{5} - \frac{16}{25} + \frac{24}{125}}$ to a simple fraction, and then to a decimal.

2. Which is the cheapest, a coat that costs £.3. 16 s. and will last nine months, or one that costs £.2. 5 s. and will only last seven months? How much will a man save in 7 years 14 weeks, by regularly wearing the cheaper one?

3. Find the square root of .007, and also of $\frac{.00125}{.72}$, to four places of decimals.

4. Divide the weekly wages £.104. 8 s. among 100 labourers, 5 foremen, and 1 superintendent; the superintendent having thrice as much as each foreman, and a foreman twice as much as a labourer.

5. A man who owes £.1,373. 6 s. 8 d., settles his bill by paying £.1,308. 2 s. What rate of discount is allowed him?

6. A man bought Brighton Railway shares some years back at 119. He is now obliged to sell some, and can only realise 63. What is his loss per cent. on the stock sold?

7. Find the numerical values of $\sin 45^\circ$, $\cos 30^\circ$, $\tan 18^\circ$, $\cot 75^\circ$, by geometrical construction, without using any tables.

8. Determine an expression for the sine of any angle of a triangle in terms of the sides of the triangle, and hence deduce a convenient expression for the area of a triangle.

Ex.—The three sides of a triangle are 450, 500, 570 feet; find its area, and greatest angle.

9. What is the height of an inaccessible object which has an angle of elevation $30^{\circ} 16'$ at A , and after retreating directly from the object to B , a distance of 325 yards, the angle of elevation is diminished to $22^{\circ} 13' 10''$?

10. A man observes that the angle of elevation of a tower on the opposite side of a river is 60° , and of another tower of the same height half a mile lower down the stream, the angle of elevation is 45° . Also the angle subtended by the feet of the two towers, is 120° . Find the breadth of the stream, and the height of each tower.

11. Find the following by the help of Logarithms:—

(1.) The values of $\frac{\sqrt{43.725}}{\sqrt[3]{5.962}}$, $\frac{(24.76)^{\frac{2}{7}}}{(.0045)^{\frac{3}{2}}}$.

(2.) A fourth proportional to $(41.06)^{\frac{1}{3}}$, $(.00056)^2$, $(120)^{\frac{2}{3}}$.

(3.) The natural sine of $43^{\circ} 25' 37''$ from a table of logarithmic sines.

(4.) The angle whose logarithmic cosine is 9.3472693.

12. What is the weight of a 13-inch shell, its thickness being two inches, a solid shot of four inches diameter weighing nine pounds?

13. How much earth must be excavated in laying a mile of 18-inch drain pipes, the lower side of the pipes being four feet below the surface; and how much earth will have to be carted away, supposing the earth returned to be so rammed as to occupy the same space after the disturbance as before?

14. A cylindrical boiler with hemispherical ends, being 17 feet long and 5 feet in diameter, how many gallons of water will it hold, the water not rising higher than within 18 inches of the horizontal top?

15. Required the number of gallons a cask holds, the length of which is 40 inches, while the girths at the two ends are 70 inches, at the middle 101.2 inches, and at 10 inches distance from each end 90 inches, the thickness of the cask being everywhere uniformly half an inch.

16. A canal has to be cut 100 feet long, the bottom being 12 feet wide throughout, and the sides being inclined at an angle of 45° to the horizon. The depths at successive distances of 10 feet are—

5, 5.4, 5.7, 6.1, 6.7, 7, 7.9, 7.2, 6.8, 6.1, 5.4 feet.

How much earth must be removed?

QUESTIONS ON SURVEYING.

Morning Paper, July 1867.

Examiner—Lieut. Colonel C. D. NEWMARCH, R. E.

Note.—You are particularly requested to write legibly, and to answer the questions as concisely as possible. Prefix the number of the question to each answer, and write your name at the top of each of your papers. Candidates must not, during the examination, refer to any book or MS., nor communicate with each other. Questions remaining unanswered at the close of the sitting cannot be taken up again afterwards.

1. Describe the course of instruction in surveying which you have undergone. What survey or levelling operations have you been employed upon? Produce any finished drawings or survey plans, *bonâ fide* of your own execution, with certificate, stating whether plotted from your own surveys or otherwise.

2. The Gunter's chain is 66 feet long—why? What is the length of a link of the Gunter's chain in yards, in feet, and in inches?

3. A survey

3. A survey being plotted and laid down to a scale of 6 inches to 1 statute mile, what proportion does that plan bear, both lineally and superficially, to the actual size of the ground?

4. Describe the mode of using a plane table, and state under what circumstances you would employ it.

5. What is the use of a triangulation, and in what manner is it carried out? Illustrate, by a diagram, how, when the measured base is unavoidably short, the sides of the principal triangles may be made rapidly to increase, without admitting any ill-conditioned triangles.

6. Describe the process of taking a round of horizontal angles with the theodolite, supposing it to be in correct adjustment, giving the reason for using two Verniers, and for making 60° and 120° zero points. Point out the particular advantages or disadvantages of a tower, a spire, or a tree, as trigonometrical stations.

7. Suppose that P is the centre of a station where it is not possible to place the theodolite, S a satellite at 20 feet distance, A and B other stations from which P has been observed, $63^\circ 30'$ and $92^\circ 15'$ the angles P S A and P S B respectively, and P A, P B, 5,000 and 6,000 feet approximately ascertained, what will be the true value of the angle A P B?

8. Explain the principle upon which inaccessible heights and distances are measured in the field by the aid of the pocket sextant, as illustrated in the following examples:—

(1.) In order to obtain the breadth A B of a river, I set off the angle A B C a right angle, and from C, 50 yards from B, I found A C B $26^\circ 34'$; on B C produced I found another station D 100 yards from C, where A C B was $7^\circ 8'$; the scale of tangents corresponding to these angles gave the numbers 2 and 8 respectively; find the distance A B.

(2.) From a point A on a horizontal plane the angle of elevation of a hill was $7^\circ 8'$; upon approaching it 1,000 feet the angle was $14^\circ 2'$. The tangents corresponding to these angles are 8 and 4 respectively taken from the divisor tables. Find the height of the hill above the horizontal plain.

9. Find, by construction, the relative position of a point X, when A X B = 19° , B X C = 25° , A B C = 160° , A B = 800 feet, B C = 1,100 feet, and state the distances A X and C X.

10. The measured distance between A and B was found to be 956 links; the reciprocal angles of elevation and depression were $2^\circ 4'$ and $2^\circ 7'$; the horizontal readings + $2'$ and + $3'$. The chain was 66.21 feet in length. Required, the horizontal and vertical distances in feet between A and B.

EXAMINATION IN SURVEYING.

Afternoon Paper, July 1867.

Examiner—Lieut. Colonel C. D. NEWMARCH, R. E.

Note.—Write your name at the top of the accompanying plans and of each of the papers which you hand in in reply to the following questions. Candidates must not communicate with or assist each other.

1. Accompanying is a traverse survey of a plot of ground near Shooter's Hill. All the angles, bearings, and measurements are recorded on the plan. From the data thus given compile a "Field Book," in the form and manner in which such observations are usually recorded when surveying in the field. The object of this question is to test your ability to keep a Field Book, so far as that can be tested otherwise than in the field. You will therefore regard the

plan as a piece of country, on the survey of which you are supposed to be engaged, and proceed to book your observations accordingly, just as you would do if actually in the field.

2. The accompanying lithographed map represents the Lakes of Killarney, and portions of the counties of Kerry and Cork in their vicinity. You are requested to consider this as a tract of country on the survey of which you are proposed to be employed, more especially with reference to the selection of the proposed new line of railway to Kenmare.

State in what manner you would proceed to execute such a survey, first, with reference to the production of such a map as you now see; and further, with reference to the more detailed surveys necessary for the selection and demarcation of the proposed new line of railroad.

The accuracy of the survey is supposed to be checked by the positions of the principal points being determined trigonometrically. You will, accordingly, select your own base line and suitable trigonometrical stations.

The plan may be drawn over in any way that you think proper in illustration of your proposed mode of procedure; and the following points should be attended to:—

A. Show, by a thick red line, the position of the proposed base; and, by thin red lines, the proposed system of triangulation.

B. Compute, as accurately as the scale will admit, the length of the proposed new line of railway.

C. Colour in the road, rivers, lakes, sea, &c., shown on the plan, finishing off the map neatly.

D. Compute the area of water embraced by the larger lake or Lough Leane.

E. Sketch in, on a separate piece of paper, and on an enlarged scale, the group of hills in the vicinity of Mangerton Mountain. This should be done as a free-hand sketch, and may be executed either with the pen or the brush, and is merely required in illustration of your capability of doing such work.

F. Explain how, in practice, you would obtain the delineation of such hills, contouring being supposed, in this instance, to be considered as an unnecessarily expensive process; detail the process of sketching in ground in the field, and state what are the necessary previous preliminary checks upon the work.

Note.—A portion of the afternoon sitting will be devoted to the Examination of some of the Candidates in the Practical Use and Adjustment of Instruments.

QUESTIONS ON LEVELLING AND PRACTICAL SURVEYING.

Morning Paper, July 1867.

Examiner—Lieut. Colonel C. D. NEWMARCH, R. E.

Note.—You are particularly requested to write legibly, and to answer the questions concisely; prefix the number of the question to each answer, and write your name at the top of each of your papers. Candidates must not communicate with or assist each other.

1. When are two points on the surface of the earth said to be on the same level? What instruments are used in levelling?

2. What is the effect of the curvature of the earth on the apparent place of any object? Prove that two-thirds of the square of the distance, in miles, is the amount in feet, of the correction for curvature.

3. What do you understand by refraction, and how do you explain the law in optics on which the effect of refraction depends? How do you ascertain the amount

amount of refraction at any time when the atmosphere is in an abnormal condition?

4. Suppose that in running a section line up a very flat slope, the levelling staves are placed as far apart as will allow of distinct vision, what will be the result on the height, omitting curvature and refraction?

5. At a horizontal distance of 8,000 yards, the vertical angle observed with a theodolite, 5 feet high to the top of a tower, was $2^{\circ} 6'$. The tower was 150 feet high, and the observer's position 260 feet above the sea level. What was the height of the foot of the tower above the sea, curvature and refraction being taken as usual?

6. How do you trace contour lines upon the ground with a spirit level or theodolite, when required to be marked out with great accuracy? At what vertical distance apart may contour lines most usefully be applied, according to the scale of the plan, the nature of the country, and the purpose for which they are required?

7. Explain the mode of ascertaining the longitude of any point by the occultation of Jupiter's satellites, or by a lunar observation.

8. The apparent time, by observation at A, was 11 a.m. A chronometer, 10 minutes fast for Greenwich, showed 8 hours 20 minutes a.m. The equation of time was 16 minutes, mean time being before apparent time. Find the longitude of A.

9. Explain the meaning of the term circum-meridian altitudes, and show how such observations are applied to finding the latitude.

10. A star's zenith distance was 68° on the meridian, its north declination 60° ; the observer south of the star, but north of the equator, and the allowance for refraction $1'$. Find the latitude.

11. In order to lay down a magnetic meridian line upon a plan, what observations are necessary to be taken upon the ground, and how is it laid down? How can you, at certain times, by means of the sun's amplitude, ascertain the variation of the compass?

12. Explain how you would ascertain the height of a hill by means of boiling water, in the absence of any table of values.

13. Describe the different methods of marking out curves on the ground, when the radii are supposed to be of considerable length, as in the case of canals, &c.

EXAMINATION IN PLOTTING AND PLAN DRAWING.

Afternoon Paper, July 1867.

Examiner—Lieut. Colonel C. D. NEWMARCH, R. E.

Note.—Write your name at the top of every paper which you hand in. Candidates must not communicate with or assist each other.

1. Accompanying is a lithographed Field Book, comprising the details of the traverse survey of a road in the vicinity of the Great Northern Railway. The measurements are given in feet. You are required to plot it on a scale of two chains to an inch. On this scale the plan will work into the general dimensions of 18 inches by 12 inches. It will be as well to commence your plot towards the upper right hand corner of the paper.

Finish off the plan neatly, colouring in the roads, houses, &c., and showing the traverse lines in red on the plan. Put in the meridian line from the compass observation taken at the first station. Print as a heading the words,

“Traverse Survey of the Road through Andover, near the Great Northern Railway, plotted by [Name].”

2. The following Field Book exhibits a line of levels taken for the construction of an embankment to protect low land against inundation. The crest of the embankment is to be raised four feet above the highest known rise of the flood waters; its exterior slope to be two to one, and interior slope one to one; the breadth of the embankment at top to be 10 feet.

You are required to plot a longitudinal section, showing thereon the proposed level of the embankment, as also the flood level. Also to plot a transverse section of the embankment at its highest point. The horizontal scale of the sections to be 100 feet to an inch, and the vertical scale 10 feet to an inch.

The height to which the embankment will require to be raised to be marked on the section at every 50 feet.

Field Book of Levels.

Number of Station.	BACK			Height of Instrument.	FORE			Rise.	Fall.
	Bearing.	Distance.	Level.		Level.	Distance.	Bearing.		
	o						o		
1	35	50	2·01	5·01	7·47 * 1·46	50	215	—	5·46
2	”	50	1·57	4·97	6·12	50	”	—	4·55
3	”	50	5·08	4·98	6·01	50	”	—	·93
4	”	50	4·02	5·02	4·99	50	”	—	·97
5	”	50	7·21	5·00	4·57	50	”	2·64	—
6	”	50	3·68	4·97	6·98	50	”	—	3·30
7	”	50	5·62	4·96	7·01	50	”	—	1·39
8	”	50	2·78	5·01	6·99	50	”	—	4·21
9	”	50	6·12	4·99	2·29	50	”	3·83	—
10	”	50	8·10	4·98	3·99	50	”	4·11	—
11	”	50	6·49	4·98	3·42	50	”	3·07	—
12	”	50	8·97	5·02	2·11	50	”	6·86	—

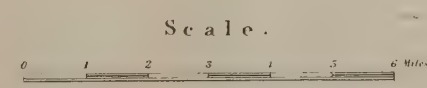
* Reading of flood level at this point.

Note.—A portion of the afternoon sitting will be devoted to the Examination, in the practical use and adjustment of instruments, of such of the candidates as there may not have been time so to examine on the previous day.

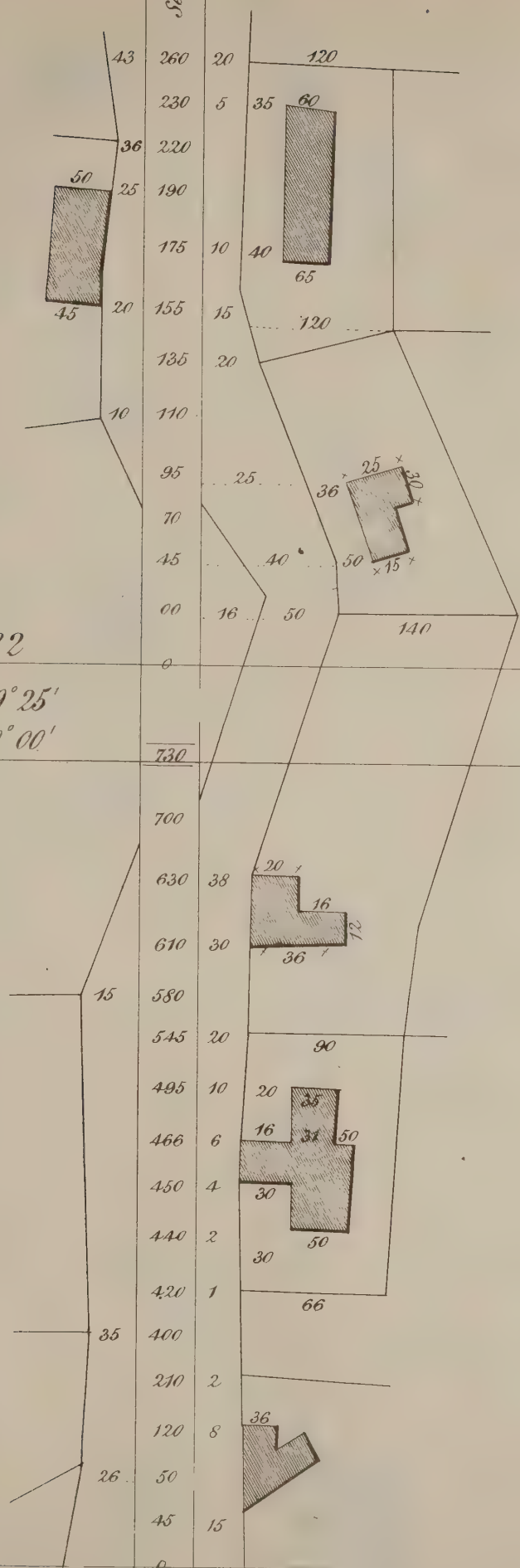
SHOOTERS HILL.



THE



See P. 2



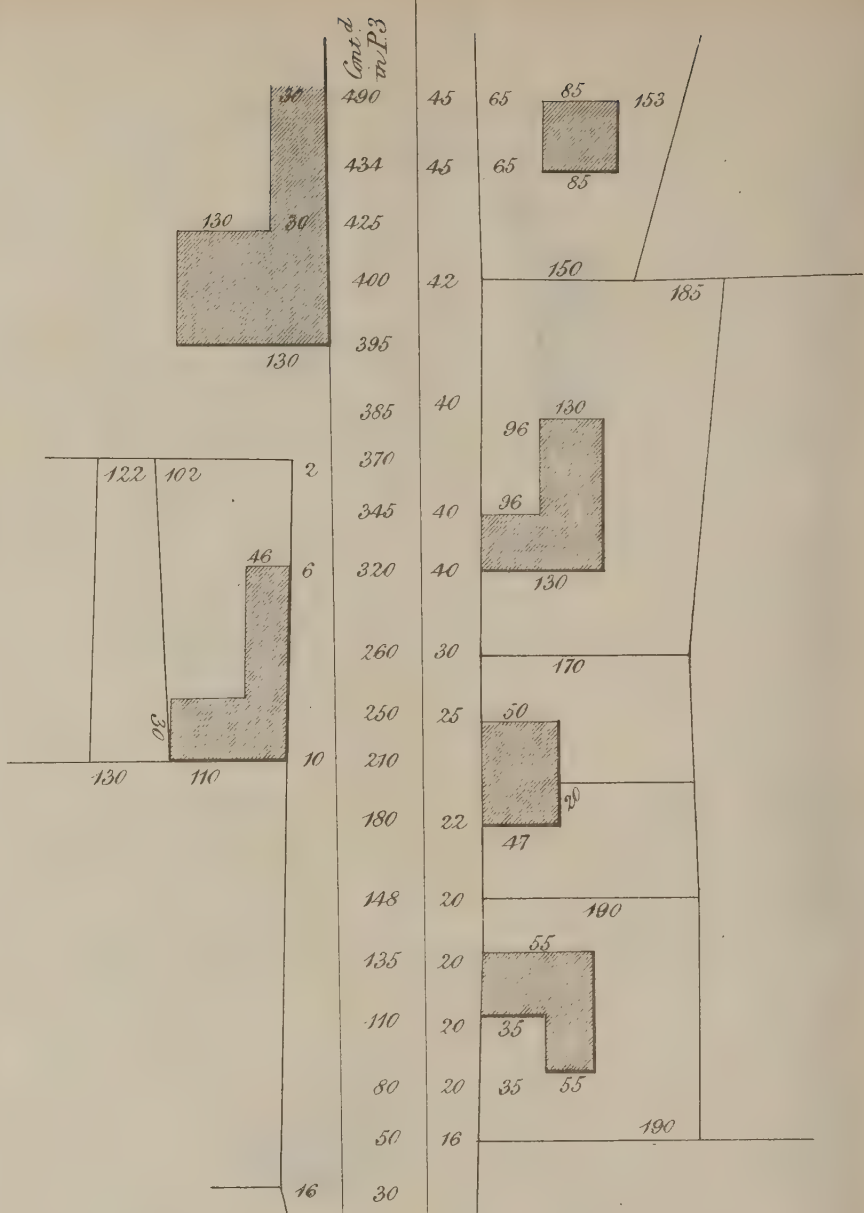
Station N°2

Fore Sight 209° 25'

Back " 00° 00'

Station N°1 Railway Bridge

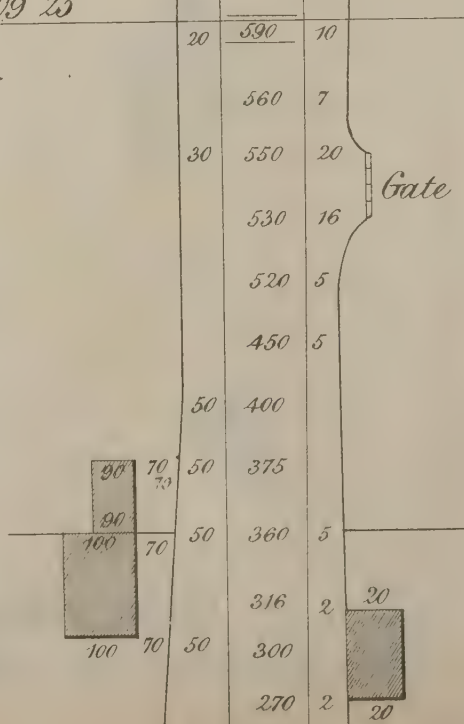
Needle Bearing 240°. Theodolite set at Zero

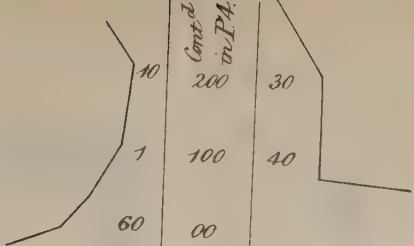


Station N^o 3

Fore Sight... 221° 30'

Back "..... 209° 25'

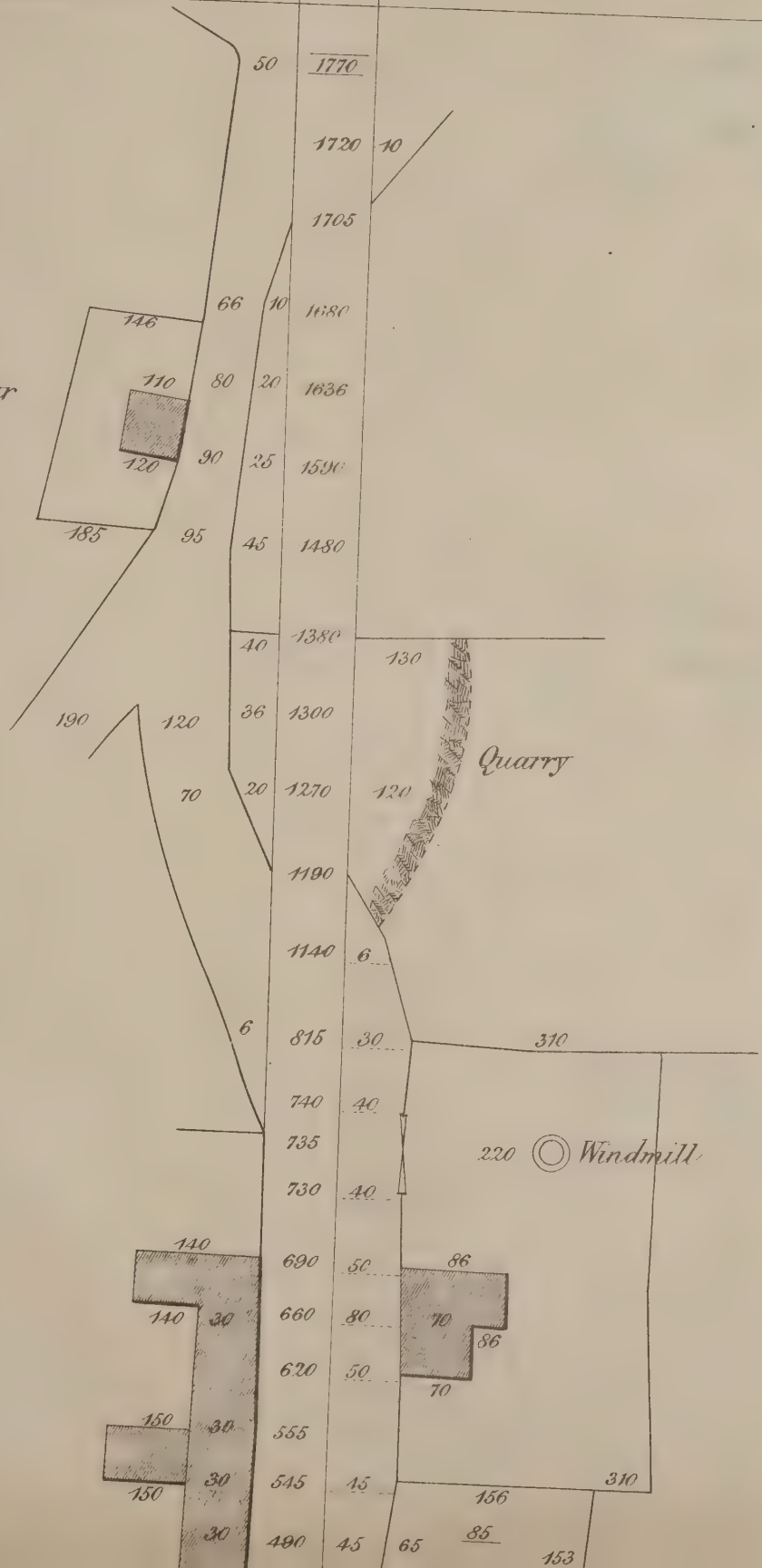


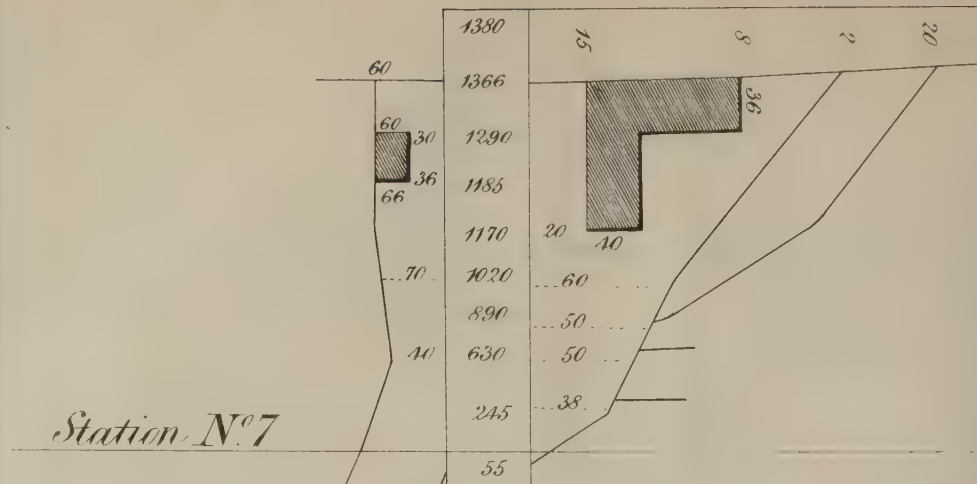


Station N^o 4.

Fore Sight 151° 20'
Back " 221° 30'

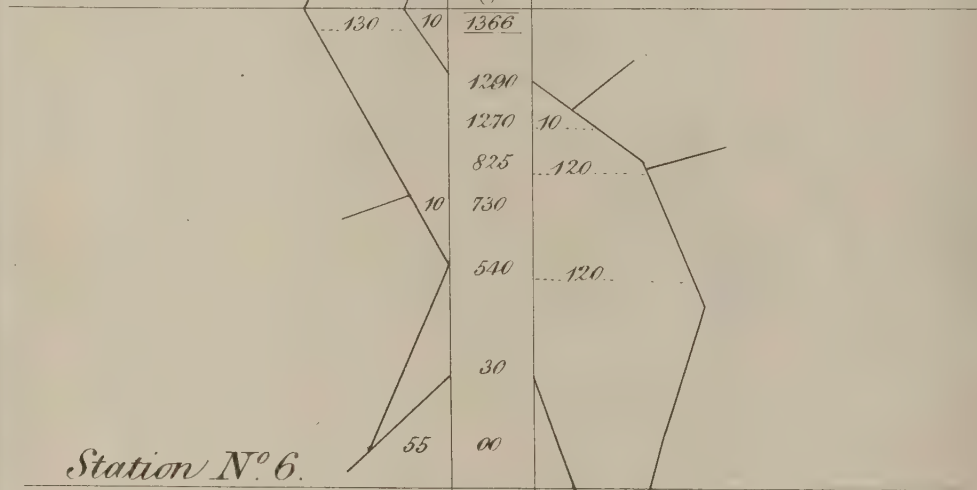
Toll Bar





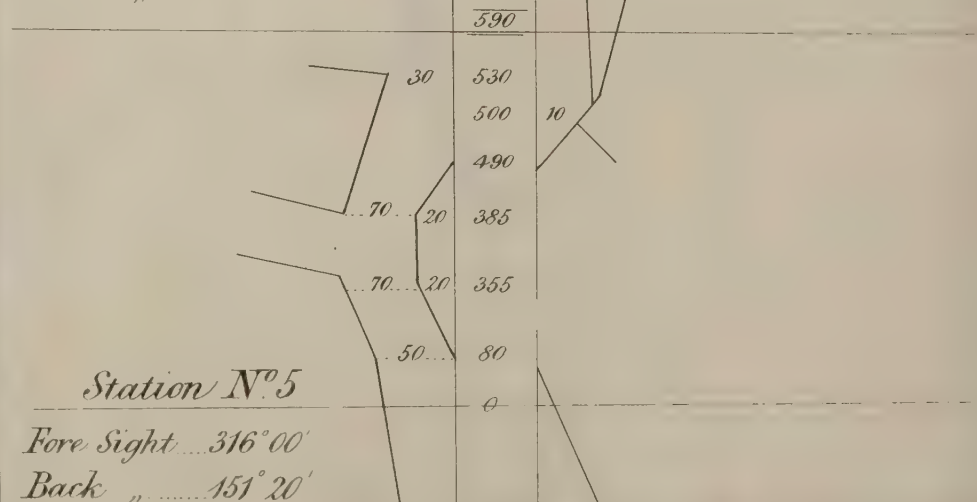
Station N°7

Fore Sight... 229° 00'
Back "..... 258° 30'



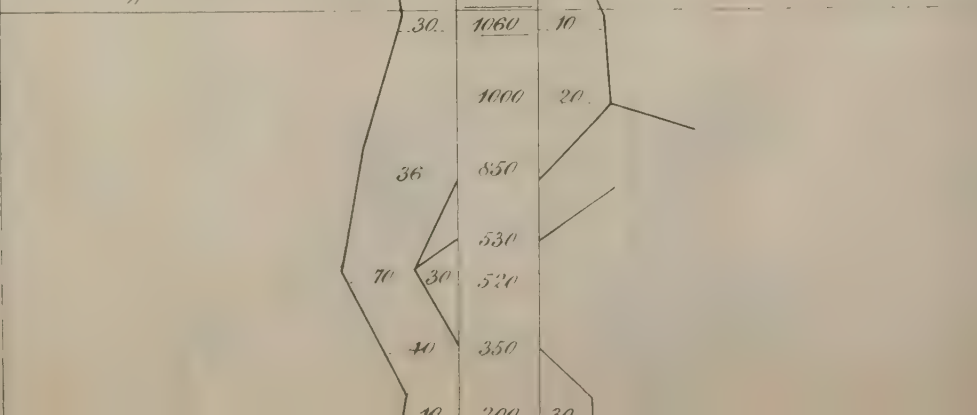
Station N°6.

Fore Sight..... 258° 30'
Back "..... 316° 00'



Station N°5

Fore Sight... 316° 00'
Back "..... 151° 20'



EAST INDIA
(ENGINEERS' ESTABLISHMENT, &c.)

RETURN of the Names of EXAMINERS appointed to examine the CANDIDATES who presented themselves since the last Return, for Admission to the ENGINEERS' ESTABLISHMENT and PUBLIC WORKS DEPARTMENT in *India*; of the Names of the SUCCESSFUL CANDIDATES in Order of Merit; of the MARKS which were assigned on each Subject to every CANDIDATE; and, of the EXAMINATION PAPERS of each SUBJECT; &c. (in continuation of Parliamentary Paper, No. 454, of Session 1866).

(*Mr. Adam.*)

*Ordered, by The House of Commons, to be Printed,
2 December 1867.*

[*Price 2 s. 4 d.*]

EAST INDIA (ENGINEERS' ESTABLISHMENT, &c.)

RETURN to an Address of the Honourable The House of Commons,
dated 20 March 1868;—for,

“ RETURN of the Names of EXAMINERS appointed to examine the CANDIDATES who presented themselves, since the last Return, for Admission to the ENGINEERS' ESTABLISHMENT and PUBLIC WORKS DEPARTMENT in *India* : ”

“ Of the Names of the SUCCESSFUL CANDIDATES in Order of Merit : ”

“ Of the MARKS which were assigned on each Subject to every Candidate : ”

“ And, of the EXAMINATION PAPERS of each Subject, &c. (in continuation of Parliamentary Paper, No. 25, of the present Session). ”

India Office, }
20 March 1868. }

W. T. THORNTON,
Secretary, Public Works Department.

(*Mr. Adam.*)

Ordered, by The House of Commons, to be Printed,
28 April 1868.

CIVIL ENGINEER EXAMINATIONS.

NAMES OF EXAMINERS.

Rev. Jonathan Cape, A.M., F.R.S.

Captain George Newmarch, R.E.

George Preston White, Esq., C.E.

SUCCESSFUL CANDIDATES in Order of Merit.

NAME.	AGE.	Engineer to whom Articled, or under whom Served.	Place of Education.
1. Mr. R. W. Everett-Green.	20	F.W. Shields, c.e., Westminster; Tiverdale Iron Company; C. P. B. Shelley, c.e., Westminster.	Not stated.
2. „ H. Lyon -	20	W. Humber, c.e., London -	Not stated.
3. „ J. N. Grainger	21	H. M's. Steam Engine Factory, Dockyard, Portsmouth.	Not stated.
4. „ F. Brickwell -	23	Ordish & Le Feuvre, c.e., Westminster; W. Perry, c.e., Beas; C.P.B. Shelley, c.e., Westminster.	Not stated.
5. „ E. Le Lievre -	23	Sir C. Fox & Sons, c.e., London	Not stated.
6. „ W. Eckstein -	21	Clayton & Co., m.e., London; W. Parsey, c.e., Westminster.	King's College, London.
7. „ S. F. Cox -	20	Stothert & Peti, m.e., Bath -	Not stated.
8. „ C. F. MacIvor	22	J. Price, c.e., M. G. W. Railways of Ireland.	Trinity College, Dublin.
9. „ J. W. Johnson	23	Ravenhill & Hodgson, m.e., London; C. P. B. Shelley, c.e., Westminster.	College, Cheltenham.
10 „ *C. Dunscombe	21	J. Price, c.e., M. G. W. Railways of Ireland.	Trinity College, Dublin.
11. „ A. H. Tyndall -	23	J. Price, c.e., M. G. W. Railways of Ireland.	Trinity College, Dublin.
12. „ R. Ewing -	21	Stewart & Menzies, c.e., Edinburgh.	Dollar Institution.
13. „ R. Wallnutt -	23	H. P. Ribton, c.e., Kingstown; J. Lynan, c.e., Ballinasloe.	Not stated.
14. „ J. W. Martin -	20	J. Ramsden, m.e., Cork -	Queen's College, Cork.
15. „ D. F. Martin -	23	K. H. Roche, c.e., Cork -	Queen's College, Cork.
16. „ J. M. Bell -	19	E. Sang & Son, c. & m.e., Edinburgh; G. Hunter, c.e., Westminster.	Not stated.

* Mr. Dunscombe did not accept an appointment.

NUMBER of MARKS which were assigned on each Subject to every Candidate.

No.	Number of Marks allotted in			TOTAL.	No.	Number of Marks allotted in			TOTAL.
	Mathematics.	Civil Engineering.	Surveying and Levelling.			Mathematics.	Civil Engineering.	Surveying and Levelling.	
1	274	335	157	766	12	239	265	107	611
2	269	330	131	730	13	200	300	110	610
3	337	260	121	718	14	205	285	116	606
4	254	335	125	714	15	234	265	106	605
5	224	335	145	704	16	210	293	101	604
6	229	330	105	664	17	218	250	72	540
7	214	335	106	655	18	156	285	86	527
8	256	295	102	653	19	170	245	86	501
9	226	285	121	632	20	129	290	80	499
10	254	245	125	624	21	133	255	99	487
11	274	245	100	619	22	77	240	108	425

PUBLIC WORKS DEPARTMENT—INDIA.

CIVIL ENGINEER ESTABLISHMENT.

EXAMINATION PAPERS for December 1867.

ARITHMETIC, TRIGONOMETRY, AND MENSURATION.—Rev. J. Cape.

1. Reduce $\frac{\frac{120}{119} - \frac{1}{239}}{1 + \frac{1}{239} \text{ of } \frac{120}{119}} + \frac{1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4}}{1 + \frac{1}{2} - \frac{1}{3} - \frac{1}{4}}$ to its lowest terms;

and also express the result as a decimal.

2. Find the value of $\frac{2}{7}$ of 15 *l.* + $3\frac{3}{7}$ of 1 *l.* + $\frac{1}{3}$ of $\frac{5}{7}$ of $\frac{2}{3}$ of 1 *l.* + $\frac{2}{3}$ of $\frac{1}{7}$ of 1 *s.*

3. Divide 1121·4 by ·534; also, 411·3519 by 58·7645.

4. Two steam ploughs are tried at an Agricultural Show; one finishes 6 acres, 2 roods, 30 perches in 7 hours 50 minutes; the other, 6 acres, 1 rood, 26 perches in 7 hours 20 minutes. Which is the best plough as regards speed?

5. What principal will amount to 739 *l.* 1 *s.* 8 $\frac{1}{4}$ *d.* in 1 year 11 months, at 4 $\frac{1}{8}$ per cent. per annum Simple Interest?

6. Cotton is bought in Bombay at 9 *d.* per lb.; the freight home is 38 *s.* per ton; it is sold here at 1 *s.* 2 *d.* per lb. What profit per cent. is made by the transaction?

7. Draw a figure illustrating the meanings of the terms *sine*, *cosine*, *tangent*, *cotangent*, *secant*, and *cosecant*. Also, it being given that the sine of an arc is ·25, determine the numerical values of the other *five* above-mentioned functions of the same arc.

8. Determine the following quantities by means of Logarithms:—

(a) the values of $\frac{\sqrt[3]{\cdot 0382972}}{1 + \sqrt{2\cdot 18}}$, and $\frac{23\cdot 01 \times 468\cdot 13 \times \cdot 0624}{368\cdot 5 \sqrt{\cdot 82608}}$.

(β) the mean proportional to 42·681 and 2·6089.

(γ) the angle whose secant is 9·3347620, from a Table of log. secants.

(δ) the natural cosine of 73° 2' 45".

9. Compute to 5 places of decimals the value of $\sqrt{\frac{1 - \sin A}{1 + \sin A}}$, when $A = 32^\circ 5' 20''$, from a Table of natural sines.

10. Solve the triangle *ABC*, it being given that $AB = 17\cdot 24$, $AC = 23\cdot 42$. $\angle A = 36^\circ 15'$.

11. Explain how we may find the width of a river (which we cannot cross) by means of a measuring tape only.

12. Two objects, *A* and *B*, are due S. E. of my first station. I travel 6 miles in a direction 30° West of South, and I find then that *A* is due East of me, while *B* bears 15° South of East. Find the distance of *A* from *B*, and show that my two positions are equidistant from *B*.

13. A mug, 4 inches in diameter, and 5 inches high, is 3 quarters full of water. Through what angle may the mug be tilted, without spilling any of the water?

Work the same for a hemispherical bowl of 6 inches radius, having 4 inches depth of water in it.

14. Find the weight of an iron roller 6 feet 6 inches long, 2 feet 4 inches in diameter, and 2 inches thick, iron weighing 464 lbs. per cubic foot.

15. What will be the cost of painting the outside of a rectangular goods' shed, with tarred-felt roof, the shed being 90 feet long, 32 feet broad, 22 feet high at the eaves, and 38 feet to the ridge of the roof, painting costing 3*d.* per square foot, and tarring 3*d.* per square yard?

16. How much earth must be excavated to form a dock 300 feet long, 25 feet deep, the sides sloping uniformly with a top and bottom breadth of 60 and 50 feet respectively, and the ends being vertical; and how many gallons of water will the dock hold when filled within 8 feet of the top? (One gallon contains 277·3 cubic inches.)

17. A tank is to be built at a station, 14 feet long, 8 feet wide, and 5 feet deep. What weight will its supports have to carry when it is full, the weight of the tank itself being 4 tons 3 cwt., and the water being supposed to weigh 1,000 ounces the cubic foot?

18. How many bricks are required to build a wall a brick and a half thick, 9 feet high, and 150 yards long? And what will it cost at 5*l.* a standard rod?

December 1867.

ALGEBRA.—Rev. J. Cape.

1. Simplify the following expressions :—

$$\frac{2}{a-b} + \frac{2}{b-c} + \frac{2}{c-a} + \frac{(a-b)^2 + (b-c)^2 + (c-a)^2}{(a-b)(b-c)(c-a)} \dots\dots\dots (\alpha)$$

$$\left\{ \frac{1}{3} + \frac{2x}{3(1-x)} \right\} \cdot \left\{ \frac{3}{4} - \frac{3x}{2(1+x)} \right\} \dots\dots\dots (\beta)$$

$$\frac{a^3 - b^3}{a^3 + b^3} \cdot \frac{a+b}{a-b} \cdot \left\{ \frac{a^2 - ab + b^2}{a^2 + ab + b^2} \right\}^2 \dots\dots\dots (\gamma)$$

2. Find the least common multiple of $x^3 + x^2y + xy^2 + y^3$, $x^3 + y^3$, and $x^3 - x^2y + xy^2 - y^3$.

3. Solve the following equations :—

$$\frac{x-5a}{4a} - \frac{x-3a}{9} = \frac{a}{18} \dots\dots\dots (\alpha)$$

$$(x^2 - 2)^2 = 2x^3 - 5x \dots\dots\dots (\beta)$$

$$\left. \begin{aligned} \frac{x^3}{y} - \frac{y^3}{x} &= \frac{65}{6} \\ \frac{x}{y} - \frac{y}{x} &= \frac{5}{6} \end{aligned} \right\} \dots\dots\dots (\gamma)$$

$$\left. \begin{aligned} \frac{1}{3}x + \frac{1}{3}y + z &= 19 \\ \frac{1}{2}x + y - \frac{1}{4}z &= 16 \\ x - \frac{1}{3}y - \frac{1}{4}z &= 14 \end{aligned} \right\} \dots\dots\dots (\delta)$$

4. Shew that $\sqrt{4+3\sqrt{-20}} + \sqrt{4-3\sqrt{-20}} = 6$; also, that

$$\frac{7+\sqrt{-3}}{2-\sqrt{-3}} + \frac{8+3\sqrt{-3}}{2+\sqrt{-3}} - \frac{4(2-\sqrt{-3})}{1-\sqrt{-3}} = \frac{1}{2}.$$

5. If

5. If $(a + b + c + d)(a - b - c + d) = (a - b + c - d)(a + b - c - d)$,
show that $a : b :: c : d$.

Also, if $a : b :: b : c$,
show that $a + b : b + c :: a^2(b - c) : b^2(a - b)$.

6. Find the sum of ten terms of the series $13 + 11\frac{1}{2} + 10 + \dots$ beginning at the *fifth*; also, find the *thirtieth* term.

7. The sum of 1,200 *l.* was to be divided among 4 persons, whose shares are in Geometrical Progression; and the difference between the greatest and least was to the difference between the means as 13:3. What were their respective shares?

8. A semaphore has *four* fixed lamps, with sliding shades to cover them, the lamps being red, green, blue, and white respectively. How many different signals may be made with it?

9. Expand $(1 - 4x)^{-\frac{1}{2}}$ and $(1 - 4x)^{-\frac{1}{2}}$ each to 5 terms; and then show by actual multiplication that the former series, when squared, becomes the same as the second.

10. There are two casks, one containing 136 gallons of wine, the other 200 gallons of water; 86 gallons are drawn off from each cask, mixed together, and the casks again filled up with the mixture. After this operation has been repeated, find how much wine there is in each cask.

11. A general sends away 800 men to guard a ford, and $\frac{4}{9}$ of the remainder of his troop on a reconnaissance, and he finds he has only $\frac{5}{17}$ of his original force left with him; of how many men did his original force consist?

12. A man of war, with a crew of 350 men, sails with just enough water to last the computed length of her voyage. After 30 days scurvy breaks out, and carries off 6 men a day till she reaches her port, which she does 3 weeks later than had been expected. Her water just lasts out the voyage. How long was it?

December 1867.

EUCLID.—Rev. J. Cape.

1. If two angles of a triangle be equal to one another, the sides which subtend, or are opposite to them, are also equal to one another.

Given the base, an angle adjacent to the base, and the difference of the other two sides; construct the triangle.

2. If two triangles have two angles of the one equal to two angles of the other, each to each; and one side equal to one side, viz. either the side adjacent to the equal angles, or the sides opposite to the equal angles in each; then shall the other sides be equal, each to each; and also the third angle of the one to the third angle of the other. *Take the first case, when the side is adjacent to the equal angles.*

If two exterior angles of a triangle be bisected, and from the point of intersection of the bisecting lines a line be drawn to the opposite angle of the triangle, it will bisect that angle.

3. To draw a straight line through a given point parallel to a given straight line.

One of the diagonals of a parallelogram being given, and the angle which it makes with one of the sides, complete the parallelogram so that the other diagonal may be parallel to a given right line.

6 PAPERS RELATING TO EXAMINATION OF CANDIDATES FOR

4. In any right angled triangle, the square which is described upon the side subtending the right angle, is equal to the squares described upon the sides which contain the right angle.

If in the figure given in Euclid— GH , KE , and FD be drawn, thus joining the exterior angular points of the three squares; show that each of the three triangles thus formed equals the given triangle ABC .

5. In obtuse angled triangles, if a perpendicular be drawn from either of the acute angles to the opposite side produced, the square of the side subtending the obtuse angle is greater than the squares of the sides containing the obtuse angle, by twice the rectangle contained by the side upon which, when produced, the perpendicular falls, and the straight line intercepted between the perpendicular and the obtuse angle.

6. In equal circles equal arcs are subtended by equal straight lines.

AB , AC are equal arcs of a circle; prove that the chord BC is parallel the tangent at A .

7. If a straight line touch a circle, and from the point of contact a straight line be drawn cutting the circle, the angles made by this line with the line which touches the circle, are equal to the angles in the alternate segments of the circle.

If two circles touch each other, any two lines passing through their point of contact will cut off arcs whose chords are parallel.

8. To describe a circle about a given square.

9. If a straight line be drawn parallel to one of the sides of a triangle, it will cut the other sides, or the other sides produced, proportionally; and if the sides, or the sides produced, be cut proportionally, the straight line which joins the points of section, will be parallel to the remaining side of the triangle.

A , B , C , D are four points in a straight line taken in order. Through A and C draw any two parallel lines AM , CN ; and through B and D draw any two parallel lines BM , DN , meeting the former in M and N . Join MN , and produce it to meet the line $ABCD$ in O . Prove that the rectangle contained by OA and OD is equal to that contained by OB and OC .

10. If two straight lines be cut by parallel planes, they shall be cut in the same ratio.

December 1867.

MECHANICS and HYDROSTATICS.—Rev. J. Cape.

1. Enunciate the theorem called the "Parallelogram of Forces." Mention any way by which the truth of it may be practically illustrated.

If 15 lbs. is the resultant of two forces, with the directions of which it makes angles of 30° and 45° respectively, what are the magnitudes of the component forces?

2. Two weights of 60 and 70 lbs. balance on a straight lever without weight. If 8 lbs. be added to the 60 lbs. the fulcrum must be shifted through the space of 15 inches to restore the equilibrium. Find the length of the lever.

3. A uniform heavy rod 16 feet long, has the last 7 feet bent at right angles to the first 9 feet. If it be hung freely from each end in turn, show how it will hang in each case.

4. A uniform beam 10 feet long is placed in a smooth hemispherical bowl of 4 feet radius. Determine the position in which the beam will rest.

5. What

5. What is meant by the "*Funicular Polygon*?" Show how the condition of equilibrium in it is determined. Also, explain briefly how this Theorem may be applied practically, to determine the required form of an arch in any particular case.

The extremities of a cord four feet in length are fixed at two points *A* and *B*, three feet apart in the same horizontal line. Three equal weights are suspended from this cord at equal distances of one foot from each other, and also from the extremities *A* and *B*. Show how the tension of each portion of the cord may be determined, and also the angle which it makes with the horizon.

6. Enunciate the Theory of Mechanical Friction, and explain the experiment by which the truth of it is usually illustrated.

A ladder 25 feet long, weighing 60 lbs., leans against a wall, the Coefficient of Friction between the ladder and the pavement being .6, and between the ladder and the wall being .5. If the ladder makes an angle of 60° with the ground, how high may a man weighing 140 lbs. ascend before it begins to slip?

7. The mean section of a stream is 12 feet by 18 inches, and its mean velocity is 35 feet per minute, and there is a fall on the stream of 16 feet. How much water per minute may be pumped up to a reservoir 300 feet above the bottom of the fall, by means of a wheel whose modulus is .75?

8. The shaft of a mine is 600 fathoms deep. How long would a 20 H.P. engine be in bringing up a basket containing one ton of coal?

9. Explain clearly the meaning of the term "Centrifugal Force," and describe by means of a figure, the part it plays in the action of Appold's Centrifugal Pump.

10. Prove the formulæ

$$s = \frac{1}{2}ft^2, \quad v^2 = 2fs.$$

A man drops a stone from the monument (202 feet high). With what velocity, and in what time, will it strike the ground?

11. How many miles an hour can a 60 H.P. engine draw a train of 76 tons up an incline of 1 in 250, the retarding force due to friction being 8 lbs. per ton.

12. Explain the constructions of the "Gridiron Pendulum," and the "Mercurial Pendulum;" and give the reason which renders such improvement in the common Pendulum necessary.

13. The specific gravity of cast iron being 7.197, what will be the weight of 10 feet of iron pipe of 4 inches bore, the metal being $1\frac{1}{4}$ inches thick?

14. A rectangular self-acting sluice gate (8 feet by 6 feet) has its longer sides horizontal. Find the pressure on the gate when the water has risen 12 feet above the top of the gate.

15. Give the construction of the Thermometer. In Reaumur's the freezing point is at 0° , and the boiling point at 80° . In Fahrenheit's they are at 32° and 212° respectively. What would Reaumur's register when Fahrenheit's stands at 120° ?

EXAMINATION PAPERS for Competitive Examination of Candidates for Appointments in the Engineer Establishment of the Department of Public Works in India, held at the India Office, London, in December 1867.

George Preston White, C.E., Examiner.

Candidates are particularly requested to attend to the following Directions :

1. Prefix the number of the question to each answer.
 2. Write legibly, and answer the questions as concisely as possible.
 3. Use free-hand sketches or diagrams wherever possible, to illustrate the answer, which must be carefully executed, in order to show the Candidate's proficiency in this style of drawing.
 4. Candidates must not, during the Examination, refer to any Book or MS., nor communicate with each other.
 5. Candidates are required to produce *bond fide* finished drawings, with certificate, respecting which there will be a *vivâ voce* examination.
 6. Write on both sides of the paper, leaving a margin of about an inch.
-

Describe the course of education you have undergone, name the Engineer to whom you have been a pupil, the number of years articed, the nature of the works on which you have been engaged, and state in what branch of the profession you have had most practical experience.

ON ARCHITECTURE, BUILDING MATERIALS, AND CONSTRUCTION.

1. DESCRIBE briefly the characteristic differences of the Doric, Ionic, and Corinthian orders of architecture, make free-hand sketches of their capitals and columns, and name some well-known examples, both ancient and modern, of each order.
2. Describe the leading features of what is commonly called Gothic architecture ; but more correctly, Christian. Point out in what it mainly differs from Classic architecture.
3. Considerable constructive skill, combined with æsthetic feeling, is displayed in Gothic architecture. Give some examples.
4. Make a free-hand sketch of the pointed roof, and point out the combination of science and beauty in its arrangement.
5. Make a free-hand sketch of the ground plan of a cathedral, and name and describe the different parts. What is the difference between the Greek and Roman cross ?
6. Explain the meaning, and describe with free-hand sketches, the following terms used in architecture, viz., Entablature, Fluting, Frieze, Intercolumniation, Metope, Pedestal, Pediment, Pilaster, Porch, Portico, Soffit.
7. Describe the nature of Ransome's patent concrete stone, and state under what circumstances, and for what parts of a building, it is most economical and desirable to employ it. Explain some of the means employed for the preservation of stone.
8. Describe the characteristic qualities of good bricks under the following heads, viz., as regards shape, sound when struck, appearance presented when broken, their absorption of water as compared to their weight, and the crushing load required per square inch.
9. Describe with free-hand sketches the different bonds used in brickwork, and explain the uses and application of hoop iron.
10. What is the best time for felling trees? Explain what changes timber undergoes in the process of seasoning, what is its *rationale*, what is the time required, and describe some of the most approved methods of preserving timber, and explain their chemical action.

11. Steel is becoming much employed instead of iron. What are the comparative advantages as regards cost, durability, and strength, for bridges and rails? and state the reasons why its substitution would be most advantageous in India.

12. The employment of good lime and cement is a matter of the greatest importance in construction; describe how you would mix mortar, the proportions you would use; specify the limes which are hydraulic, and what tests you would employ, and name some of the best authorities on the subject.

ON LIGHTHOUSES and CONSTRUCTIONS in IRON.

THE accompanying drawing* represents the Buda Iron Lighthouse, designed by his Excellency Don Lucio del Vallé, for the Spanish Government, and erected at the mouth of the Ebro, the ironwork being manufactured, and the details of construction designed and carried out by Mr. J. H. Porter, at Birmingham. The height of the structure, from the pile caps to the platform of the gallery at the summit, is 150 feet, giving a height from the mean level of the Mediterranean to the centre of the light, of about 169 feet. The total weight of iron employed above the piles is about 200 tons. The structure is supported on nine wrought-iron screw piles in a sandy foundation.

* See Drawing opposite.

1. Make free-hand sketches of the section you would consider best for the eight principal ascending supports, and sketch details of the connection of these with the horizontal stiffening frames.

2. The central column contains an iron staircase. Sketch your ideas of the best mode of constructing this, and explain how the weight is distributed upon the external supports.

3. Specify some of the conditions under which the "screw pile" is superior to other supports for foundations.

4. What load per square foot of its surface would a cast-iron screw fixed upon a wrought-iron pile safely sustain in a firm sand?

5. What sized screws would you recommend for the nine piles upon which this structure is supported? Would you prefer a wrought or a cast-iron pile? Describe the effects of sea water on iron.

6. Give an approximate estimate of the cost of manufacturing a lighthouse of this description, not including the lantern and light, and specify the parts of this structure you would make of wrought and of cast-iron.

7. In designing a structure of this character, a very important element for consideration is the force of the wind during a cyclone. Give the result of the experiments of Smeaton and others on this subject. State at how many pounds per square foot you would estimate it, and how you would ascertain the amount of area exposed to it in this case.

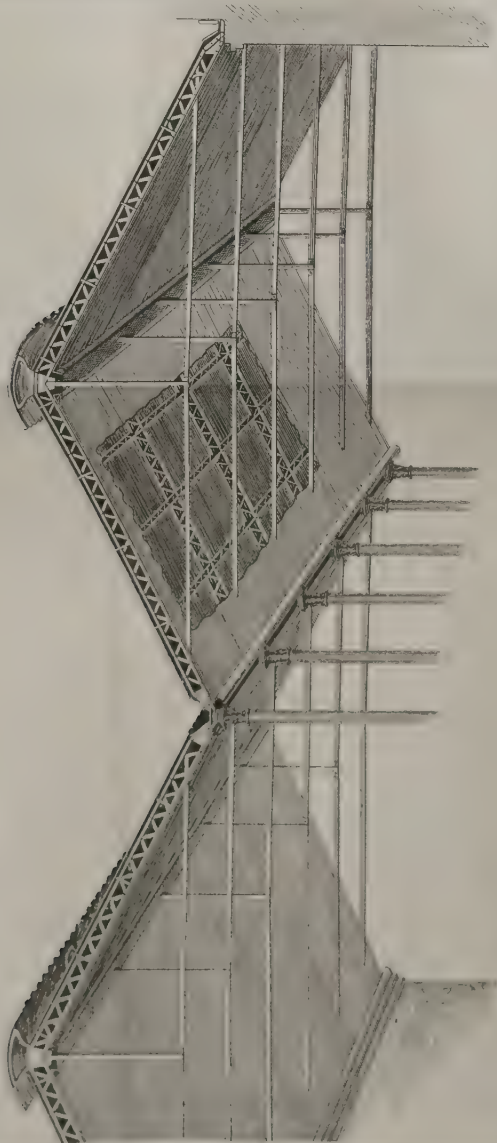
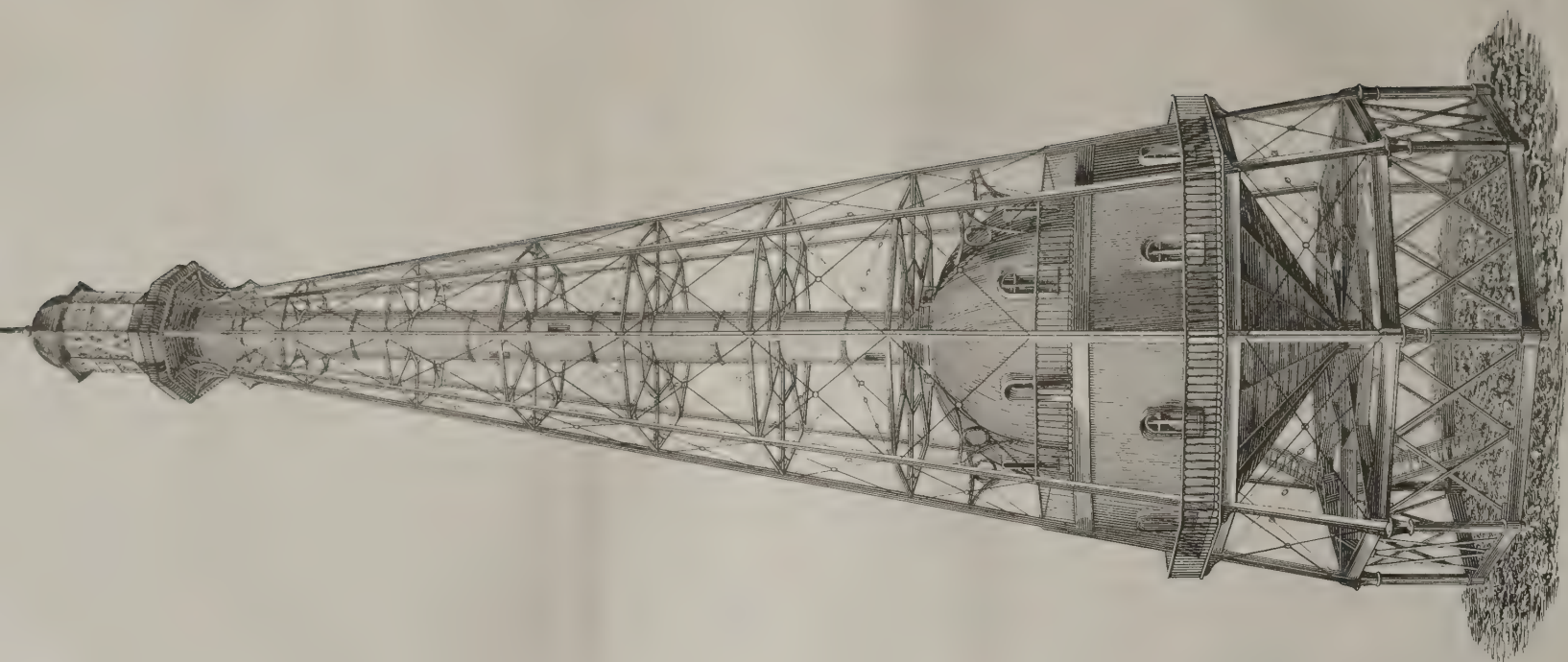
8. Give the names of some important examples of lighthouses of iron and stone; their comparative height; and the names of standard works of reference on lighthouse construction.

9. Sketch, in detail, what you consider the best means and apparatus for screwing down the piles in dry land and under water.

ON IRON ROOFS.

The accompanying design* represents an iron roof, of 40 feet span, manufactured in England, and erected at Calcutta. As a protection against heat, the roof is double, with an outer and inner covering of galvanised corrugated iron, with a space of 12 inches between. The principals, in order to interfere as little as possible with the inner covering, are formed of lattice work, 10 inches in depth, and sufficiently rigid to dispense with the ordinary "trussing" of struts and ties. The tie-bar consists of a flat iron, supported in

* See Design opposite.



the centre by a lighter bar suspended from a connecting plate at the centre. The gutters are made very large, to provide against tropical rains. For ventilation, there is an opening of 17 inches at the top of the roof, and suspended beneath a plate of perforated zinc; a small raised roof, with projecting eaves, protects the opening from rain. The inner covering stops short at the end of the rafter at foot, to assist ventilation: a moulding below conceals this from view, and also serves as a gutter for any condensed moisture.

1. Make an approximate estimate of the cost of such a roof per "square" of 100 superficial feet, together with a specification. Make detailed sketches of the various parts of the roof, with dimensions figured on, and show mode of fastening the corrugated iron plates to principals, &c.

2. State what protection you would recommend to preserve the corrugated iron, and what wire gauge you would adopt.

3. The columns, 11 feet in height, were necessary as supports for the shafting to drive machinery. Had they not been thus required, which would be preferable and least costly,—a roof of two spans of 40 feet, or one span of 80 feet?

4. Having regard to the heat of the climate, the heavy rain-fall at certain seasons, the great force of the hurricanes, and the necessity for good ventilation for a large number of people, would the single or double span be preferable, apart from the question of cost? and give your reasons.

5. What do you estimate as the maximum pressure of the wind per square foot, on the surface of the roof? Explain what tests you would subject the roof to before its erection.

6. Make a free-hand sketch for a curved roof of 40 feet span. Sketch the kind of principals and purlins you would adopt, and state at what distance apart you would place them, and the pitch of corrugation and gauge you would specify for the covering, and what overlap at the joints.

ON IRRIGATION, DRAINAGE, WATER SUPPLY, &c.

1. A great desideratum in irrigation is a module which will give a uniform discharge of water in small channels issuing from a large canal, of which the depth or head of water is constantly varying. Can you suggest any simple machine for effecting this?

2. The bed of a canal is 50 feet wide, the depth of water 5 feet, the side slopes 1 to 1, the slope of bed 1 in 4,000; required the mean velocity and discharge in cubic feet per second.

3. Will the velocity in the above example be too great for a soil of firm gravel; and is it desirable to give a canal simply intended for irrigation as high a velocity as possible, consistent with safety?

4. The canal in question (No. 2) has to be carried over a country of which the general slope is 1 in 2,000. How will this be effected? Give a free-hand sketch of the section of any masonry works that may be required to keep the level of the water nearly the same as that of the country.

5. A canal, of discharge 25 cubic feet, and velocity 30 inches per second, has to be carried by a masonry syphon under the sandy bed of a torrent, which crosses the canal at a level of 15 feet below it. Give a sketch of the syphon you would build.

6. In the last question, what would be the diameter, and what the thickness, of a wrought-iron pipe to be used for the syphon instead of masonry?

7. Make free-hand sketch, and describe the different means employed for jointing gas and water pipes, point out their comparative merits or defects, and explain the advantages of the bored and turned joints manufactured by Messrs. D. Y. Stewart & Co., of Glasgow, over the old systems.

8. Describe

8. Describe the different means employed to filter water, explain the chemical action of Spencer's "Magnetic Carbide," and the modes of ascertaining the comparative softness and purity of water for domestic and manufacturing purposes by the soap and other tests.

9. State what are the chief requirements in water for town supplies.

10. Describe the pumping system of supply, give illustrative examples, and point out cases of combined supply where both gravitation and pumping are resorted to.

11. Explain shortly the system of supply from wells, and define what is called an Artesian well, and the best geological water-bearing strata.

ON PHYSICAL MAPS, &c.

There are many subjects which can be better illustrated by the aid of physical maps than in any other way. If required to report on the agricultural, mineral, and other capabilities and resources of a district, and the best means of developing them by opening up communications, and by works of irrigation, &c., describe how you would illustrate your report by the aid of physical maps, and mark on the accompanying map, by colours and otherwise, the following features :—

1. The geological and mineralogical features of the district, as, for example, the stratified and unstratified rocks, coal fields, iron, lead, copper, tin, and other mineral productions, building stone, lime, &c.

2. Physical map indicating the river systems, mountain ranges, marking on natural drainage of the country, watershed, &c.

3. Hydrographic chart of the ocean, with soundings indicating direction of the currents, prevailing winds, trade routes, imports and exports, &c., from different harbours.

4. Meteorological map, marking on ranges of temperature, rainfall, &c.

5. Botanical map, showing geographical position of food-producing and other useful plants, as rice, corn, maize, sugar, tobacco, indigo, cotton, flax, opium, and forest timber.

6. Public works map, showing roads, tramways, railways, canals of navigation and irrigation, works of drainage.

7. Map showing comparative density of population.

8. Traffic map, showing amount and direction of passenger, goods, and merchandize traffic.

9. Military map, showing forts, military stations, disposition of troops, electric telegraph stations, &c.

10. Describe the characteristics and topographical references usually employed in the Ordnance and other surveys to denote the following, viz.—boundaries of counties, parishes, baronies and townlands; also, the marks used to denote lime-kilns, brickfields, collieries, bridges, forts, gravel-pits, waste or uncultivated land, trigonometrical points, weirs or dams, canal locks, wells, quarries, coal, iron, copper, lead and tin.

Note.—Physical maps are capable of being applied to many other subjects not hitherto used, and may be most usefully employed to illustrate reports. I therefore wish particularly to direct your attention to this interesting subject.

The following Remarks of the President of the Institution of CIVIL ENGINEERS are deserving of your most careful attention and study :—

The rapid growth of communities has developed the necessity of provision being made for a more abundant supply of pure water, and for a more complete system of sewerage than is now generally possessed by our towns and cities. Some of these works are already being carried out, or seriously contemplated, on a scale of almost startling, but not unnecessary, magnitude.

It is plain, that in every department of civil engineering the wants of commerce and society are pressing more and more urgently upon the resources of our profession. We have ship canals, but the Suez Canal throws them all into the shade. We have long tunnels through our English mountains, but we have now to penetrate the Alps. We have large bridges, but larger are required. We have noble ports, but they are choked with trade, and new accommodation of an improved kind is called for. We have steam ferries across rivers, estuaries, and straits, and rapid ocean steamers, but higher speed and better accommodation are demanded. We have large warehouses with convenient mechanical appliances, but larger warehouses and better mechanical appliances have become a necessity. We have many thousands of miles of telegraphic communication, but nothing short of its universal extension will suffice.

In the solution of these problems, thus rapidly indicated, and in others which could be easily adduced, we may rest perfectly satisfied that the difficulties they present are not to be overcome by a stroke of genius or by a sudden happy thought, but they must be worked out patiently by the combination of true engineering principles, ripe experience, and sound judgment.

Having thus called your attention to the peculiar position of our profession in consequence of its rapid growth, and pointed out some of the problems which await an early solution, I shall now attempt to describe the nature of the functions of the modern CIVIL ENGINEER; and consider how the coming generation can be best prepared for its inevitable work.

Although we know from history that men have existed from the earliest times who have been distinguished by great mechanical capacity, remarkable skill in working materials, profound science, and constructive knowledge, yet it is only during the present century that civil engineering can be considered to have become a distinct and recognised profession. Now, however, it has assumed the position of an *art* of the highest order. Perhaps we may without arrogance be entitled to claim for it the title of a true *science*.

Many attempts have been made to define and describe a civil engineer in a few general words, but all such attempts have been more or less unsatisfactory. Still, though it is difficult, if not impossible, to describe an engineer by a short definition, it is not so difficult to enumerate and describe the nature of the works he is required to design and execute, and the professional duties he is called upon to perform.

He has to design and prepare drawings, specifications, and estimates, and to superintend the carrying out of works which may be thus enumerated :—

1. Railways, roads, canals, rivers, and all modes of inland communication.
2. Water supply, gas works, sewerage, and all other works relating to the health and convenience of towns and cities.
3. The reclamation, drainage, and irrigation of large tracts of country.
4. Harbours of refuge and of commerce, docks, piers, and other branches of hydraulic engineering.
5. Works connected with large mines, quarries, ironworks, and other branches of mineral engineering.
6. Works on a large scale connected with steam-engines, with machinery, ship-building, and mechanical engineering.

This list, which might be almost indefinitely extended, involves a vast variety of work, and must appear almost appalling to a young engineer. Yet it greatly concerns his future success that he should as far as possible be prepared to undertake any or all of the works embraced in the list.

I believe the personal history of most of us would show that circumstances have led us in a widely different direction, in the exercise of our profession, from that which we originally contemplated, and that the success of many men may be distinctly traced to their ability to avail themselves of unforeseen opportunities to advance in some new direction.

The civil engineer must therefore be prepared for the various classes of constructive works thus enumerated; but in addition to this professional preparation, it is of the first importance, as affecting his true position, and the confidence which ought to be reposed in him, that he should also have a correct appreciation of the objects of each work contemplated, as well as their true value, so that sound advice may be given as to the best means of attaining them; and he must be prepared, if necessary, to advise his employers that the objects which are sought are not commercially worth the cost of the means which would secure them. It is not the business of an engineer to build a fine bridge, or to construct a magnificent engineering work, for the purpose of displaying his professional attainments, but, whatever the temptation may be, his duty is to accomplish the end and aim of his employers by such works and such means as are, on the whole, the best and most economically adapted for the purpose.

The first question which will present itself to an engineer with respect to any proposed work, will be the selection of his material; and as this question is so vital to the accomplishment of a satisfactory result, I propose to treat it in a preliminary and special manner. I wish to impress upon every young engineer a due sense of its importance, because probably a greater number of mistakes have been made by the use of a wrong material, than from any other cause.

In the case of stone work, it is essential that the mode of construction shall have reference to the character of the stone; and this requires much of the knowledge of the geologist, the stonemason, and the quarryman, so that the engineer may know how best to work and set the stone, and what are the peculiarities of the quarry as to its sound or unsound beds; and, in addition, he should have sufficient chemical knowledge to detect any unfitness in the conditions of use to which he proposes to subject the stone.

Let us always bear in mind, in connection with this subject, the example of Sir Christopher Wren, engineer as well as architect, who himself selected the quarries, and sometimes even the blocks of which his structures were composed.

Of bricks I must be content with saying, that the power of detecting the good from the bad, the suitable from the unsuitable, must be acquired by the combined assistance of reading, experiment, and practice.

A knowledge of lime, and the art of making the best practicable mortar from each description of building lime, is almost of equal importance to that required for selecting the stone, brick, and building materials themselves, but it is somewhat remarkable, that the art of preparing mortar in a proper manner is not so general as it deserves to be; and to secure good mortar is a matter of continual anxiety to the engineer.

Mortar for engineering works is ordinarily made from cement (chiefly Portland cement); or from hydraulic lime, such as lias; or from ordinary lime, such as grey or chalk lime.

Cement is chiefly used in combination with sand in various proportions, according to the nature of the work to be executed, and it is not only necessary to possess the requisite knowledge and experience for determining the proper proportions of cement and sand for each individual case, but it is desirable to have the means of determining by direct and repeated experiment the strength and quality of the cement which it is intended to use.

In the case of hydraulic lime, such as lias, the same general knowledge of the proper proportion of sand to be used is also requisite, but, from the great variation in the character of lias lime, and the different proportions of silica and alumina in combination with the lime itself, it is essential to obtain a careful chemical analysis, in order to avoid the great disappointment and bad consequences which may result from ignorance of the various qualities.

Of ordinary limes, it is only necessary here to say that they are of almost infinite variety as to quality and constituent parts, and must each be dealt with accordingly, and the engineer can scarcely take too much trouble to inform himself of the exact nature of each lime he has to use, and the best mode of using it.

Modern science, and the convenient manner in which steam-power can now be applied, have given to the modern engineer the means of obtaining better mortar from the same materials than was possible before the general introduction of steam.

The heavy rollers and iron pan worked by steam-power are now almost universally used for grinding and mixing lime and sand for works of magnitude: they produce, with properly proportioned ingredients, a mortar so good in quality, and so equal in the time and power of setting, that the engineer can calculate with certainty upon the conditions under which his designs will be carried out: and when he has become thoroughly acquainted with the quality and power of good mortar, and acquired confidence in its use, he will feel himself justified in its adoption in cases where our predecessors, and even some modern engineers, would have hardly ventured to employ it in the place of the more costly Portland cement.

When iron is intended to be used in structures, it is essential to know under what circumstances cast iron is best for the purpose, or when wrought iron should be employed, and also when steel must be resorted to. The profession has probably been assisted to a greater extent by the experiments and writing of its members, and of distinguished men of science, in the material of iron, than on any other subject; but these valuable investigations and experiments must be supplemented by the practical knowledge which can only be acquired by attentively studying the peculiarities of material and manufacture.

Cast iron or pig iron re-melted and run into moulds is largely used by engineers for columns and other parts requiring great power of resisting compressive strains; and, as its price per ton is generally about one-half of that of wrought iron, it becomes a matter of economic importance to adopt it in all cases where it can be safely and properly used, but it is of the most varied quality and strength, and the greatest attention of the engineer is required to secure the proper kind.

Wrought iron is perhaps less varied in its quality than cast iron, and for many purposes of engineering it is the safer metal to adopt, from its greater power of resisting tensile strains, and less liability to sudden fractures; but it must be remembered that wrought iron is sometimes pure and of high quality, sometimes very impure and of the commonest quality, and even with the same degree of purity it may be soft and fibrous, or hard and crystalline; therefore it is obvious that the young engineer should acquire a sound knowledge of its nature both chemically and practically, so as to enable him to obtain the quality he desires, and to know when he has secured it.

It would be easy to enlarge upon this interesting question of wrought iron, but it may suffice to instance armour-plates and rails, as cases where the best quality is required, but the quality, though best, must be different in kind; for armour-plates the iron can scarcely be too soft and fibrous, whilst for rails it can scarcely be too hard and crystalline, provided it is not so brittle as to be liable to fracture by use. Again, in some iron, such as the "best Yorkshire," the quality appears to improve with every additional operation in the manufacture, whilst the ordinary Welsh iron is almost destroyed by repeated manipulation. All these, and many other matters connected with iron, should therefore be known thoroughly and practically to the engineer.

In order to illustrate the necessity of the systematic study of the peculiarities of the metals called iron and steel, let me refer to the experiments of Mr. Eaton Hodgkinson, which first demonstrated that the average resistance of cast iron to crushing was more than six times its tenacity, whilst the resistance of wrought iron to crushing was only four-fifths of its tenacity, and it will be remembered that the mathematical investigations he founded upon these experiments first established, on a satisfactory and reliable basis, the degree and ratio of tensile and crushing force in cast and wrought iron.

With respect to steel, it must be admitted, that before we can safely adopt it to any considerable extent for purposes of construction, it will be necessary to have a similar series of experiments and investigations specially made, but so promising a metal will amply repay all the trouble that may be bestowed upon it.

Of timber a thorough knowledge should be acquired, as no material is otherwise more likely to deceive and to disappoint the engineer. Not only is great difference found in trees of the same general description, such as the numerous varieties of the pine, but the same kind of pine is a different quality of wood in different countries, and even in different soils and climate in the same country; and again the same tree is entirely changed by being "bled," or having its sap withdrawn. The oaks of America, England, and the Continent, are entirely different in their character, and oaks also differ in quality from each other in the same country, and so with numerous other woods used by the engineer. The strength, durability, and peculiarity of different kinds of timber, and the true value of artificially preserving them, should also be known and understood.

I have selected these examples for the purpose of illustrating this important fact, that before an engineer can even commence the designs of his works he must have previously obtained a large amount of preliminary information regarding the nature of all the materials employed upon engineering works, so as to enable him to select for his intended structures those materials which will be on the whole most suitable, having reference to efficiency, durability, and economy.

I will now proceed to the question of the kind and degree of knowledge which is required to enable a young engineer to proceed to the actual design of a public work of importance, such as a railway with its stone, brick, and iron structures, its earthworks, and its all-important permanent way, a railway station, a station roof, docks and their appliances, waterworks, breakwaters, or a Great Eastern steam-ship.

Although it has become the practice in modern times for many civil engineers to be employed chiefly, or almost entirely, in some one branch of the profession, I desire to repeat my conviction that it is most important that the early preparation and subsequent study should be as extensive as possible, and should embrace every branch of professional practice, not only for the purpose of securing to a young engineer more numerous opportunities for his advancement, but also because sound knowledge and experience in all branches of engineering will greatly add to his efficiency and value in any special branch, in the same manner that a medical man will be more reliable in his practice on the eye and ear if he possesses a sound practical and theoretical knowledge of every part of the human frame.

The professional knowledge required by the *railway engineer* commences with surveying of all kinds, the use of the theodolite, the aneroid barometer, the level, the sextant, &c., and includes the surveys for preliminary and parliamentary purposes; and also working surveys of minute accuracy, on a large scale, from which engineering works may be set out with precision upon the ground.

The railway engineer must understand thoroughly the nature of earthworks of every kind, and the proper angles or slopes to be adopted for cuttings and embankments.

He must have the qualifications requisite to enable him to design bridges, viaducts, tunnels, and all other incidental works and buildings in the best and most economical manner.

He must have a knowledge of the training of rivers, and of the effect of floods and drainage, in order that he may make accurate provision for the due discharge of water without wasting money on works unnecessarily large, or to avoid the risk of damage arising from making them insufficient.

He must be familiar with the various characters of permanent way, the best description of rail, sleeper, fastenings, and ballast, and with the different descriptions of switches, crossings, turntables, signals, and telegraphs.

The railway engineer should not be destitute of some knowledge of architecture, and such a taste for those graceful outlines and simple appropriate details which should always characterize the works of an engineer, so as to be able to avoid, on the one hand, the unnatural ornamentation which seems to have no connexion with the structure, and, on the other hand, a disregard of either form, outline, or proportion.

But all such knowledge may fail if there be not a constant supervision and control over the ~~work~~ ^{use} of all the materials and workmanship employed upon the railway. And it is not too much to say that without the practical knowledge which is obtainable only by the actual performance of the duties of resident engineer, it is hopeless to expect that any engineer can be competent to undertake the responsibility of important works, or be fit to have large sums of money entrusted to him for expenditure. It is in the capacity of resident engineer that all previous preparation, both scholastic and professional, and all theoretical acquirements, become utilized and rendered of practical value, and it is only after much experience on different works of varied character, dimensions, and materials, and the acquisition of the power of discriminating between good and bad materials and workmanship, that a young student of engineering can claim to take rank as a "Civil Engineer."

The *waterworks and drainage engineer* must possess many of the qualifications of the railway and dock engineer, and especially those which concern earthwork and masonry; he must also be familiar with the means of obtaining information on the subject of rainfall in different localities, the methods of correctly gauging streams of every kind; the proportions of the rainfall available for his purposes, after estimating for evaporation and waste, and the extent of the provision to be made for periods of dry weather, or for compensation to mill-owners and other interested parties.

He must be conversant with the proper mode of executing the works of reservoirs, conduits, weirs, tunnels, and aqueducts.

He must understand, by the aid of the chemist and his own experience, the nature of the impurities in water, and the best mode of diminishing them, whether mechanically, by subsidence and filtration, or otherwise.

To the waterworks engineer we must look for the solution of one of the great problems which the rapid increase of population is now forcing upon us, viz., a comprehensive system of conservancy of the flood waters of mountainous localities for the use of large cities and towns and densely populated districts. We are completely outgrowing our present arrangements for water supply in the great majority of instances; and the convenience, comfort, and health of the public demand that such works when required shall be no longer postponed.

The waterworks engineer must also be competent to design and superintend works of sewerage, as well as of water supply, for large and small towns and localities; and his familiarity with waterworks will naturally aid him in this, as the problems for the discharge and pressure of fluids are identical in both cases.

It is no longer a matter of doubt that deodorisation or purification is quite practicable in every locality, and therefore no sewage should ever be permitted to be discharged into existing streams without this purification, or it should be carried out to the sea, and there discharged, as is now proposed for the north side of London.

The *mechanical engineer* deals with the most varied and numerous subjects of all the branches of engineering. They require that he should thoroughly understand the means of producing mechanical power, and of applying it to all the infinite variety of purposes for which it is now demanded. To this end he should be master of the laws of motion and rest, of power and speed, of heat and cold, of liquids and gases.

He must be familiar with the strength of materials under every variety of strain, the proper proportions of parts, and the friction of surfaces.

He must apply existing tools, and contrive new ones, for his work, and know how to direct power in the raising of weights, or for driving all fixed machinery, or in producing locomotion on land or water.

On railways he is responsible for the vast number of objects required in the machinery for erecting and repairing shops for the engines and carriages, for the pumping and other fixed engines, and especially for the locomotive engine itself, and for rolling and fixed plant generally.

In connection with docks he is required to design the machinery for opening and closing the dock gates, working sluices, emptying graving docks, or for working the cranes on the quays, or in the sheds and warehouses.

The mechanical engineer generally also executes the designs of the gas engineer, even when he does not originate the work which is entrusted to him; and in this branch considerable chemical knowledge must be added to his mechanical qualifications.

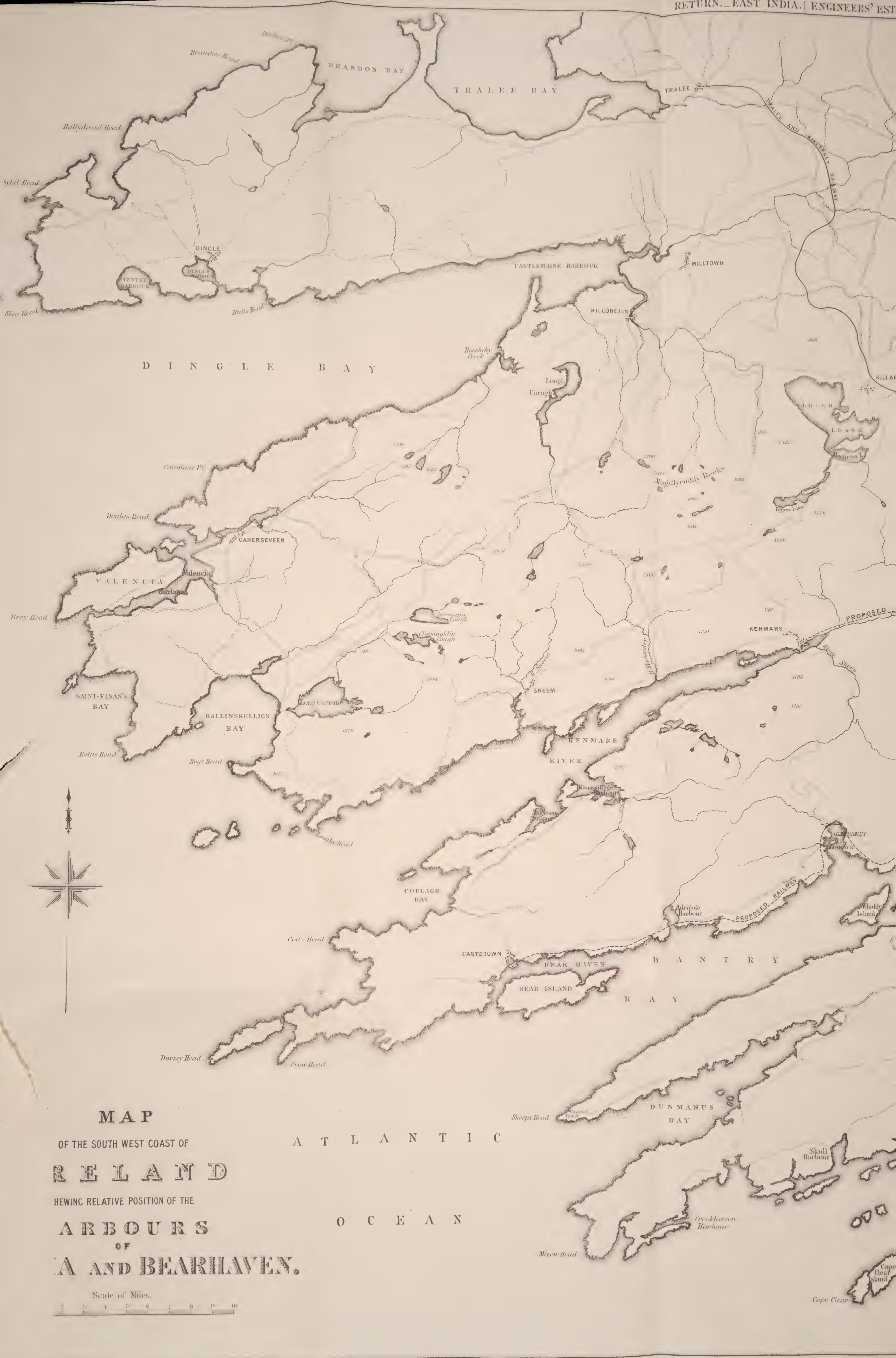
For waterworks he designs and executes pumping engines, sluices, valves, stopcocks.

In the case of mines he supplies designs of the engines for pumping, drawing, winding, or ventilating; for locomotives above and below ground, as well as for the various mechanical appliances required in collieries, mines, and ironworks.

The *mining engineer* must possess much of the knowledge of the railway and the mechanical engineer, and he must add to that general knowledge much special knowledge of his own. He must know how to sink shafts to the minerals if they require to be extracted from beneath the surface (which is usually the case), and how to divert or pump out the water he meets with, either in the shafts or the workings.

He must know how to excavate and bring to the surface minerals, whether they be coal, copper, tin, lead, or iron, and to do this he must construct subterranean railways, provide means of ventilation by fans or furnaces, supply power to lift the extracted mineral to the surface; and when brought there, he must understand the further requisite work, as the coal will probably require screening, or washing, or manufacturing into coke, and the ore will require crushing, washing, or smelting, or possibly all three operations.

In all these cases, and many others, such as the collection of surface ironstone and other minerals, by railways and locomotive engines, and the working of lifts and inclined planes, the mining engineer has most important functions to perform, and has special machinery to adapt or invent; and, relying on his judgment and skill alone, the investment of large sums of money for the development of the mineral wealth of this country is annually made.



MAP

OF THE SOUTH WEST COAST OF

IRELAND

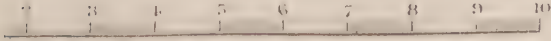
SHOWING RELATIVE POSITION OF THE

HARBOURS

OF

DINGLE AND BEARHAVEN.

Scale of Miles.



QUESTIONS ON SURVEYING.

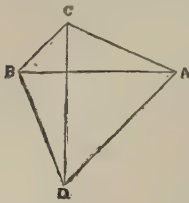
December 1867.—Morning Paper.

Examiner—Captain G. NEWMARCH, R. E.

Note.—You are particularly requested to write legibly, and to answer the questions as concisely as possible. Prefix the number of the question to each answer, and write your name at the top of each of your Papers. Candidates must not, during the Examination, refer to any book or MS., nor communicate with each other; their doing so will disqualify them. Questions remaining unanswered at the close of the sitting cannot be taken up again afterwards.

1. Describe the course of instruction in surveying you have undergone. What surveys or levelling operations have you been employed upon? Produce any finished drawings or survey plans *bond fide* of your own execution, with certificate stating whether plotted from your own surveys or otherwise.
2. Describe briefly the method of conducting a trigonometrical survey, and the principal points to be attended to, in the order of their importance, to ensure a correct result.
3. Explain what is meant by a “base of verification.” Give a brief account of the method of measuring a base line with which you are best acquainted.
4. Illustrate by a diagram and work out the formula for reducing a base measured on an elevated plan to its true value at the level of the sea.
5. Describe the chains used in surveying, why they are of the prescribed lengths, and how the exact standard length is ensured where great accuracy is required.
6. In chaining a line you come across a wide stream; how would you continue the measurement, and determine the breadth of the stream, and the position of a shoal or fixed point in mid-stream?
7. What element of error renders heights obtained by means of vertical angles extremely uncertain?
8. In observing vertical angles, why should the telescope be reversed in its Y's in making the second observation?
9. How would you ascertain the variation of the compass with only a pocket compass, the latitude being known? 2nd, in any other way you are acquainted with.
10. How are the cross hairs in a theodolite fixed, and how would you replace them if broken?
11. How is the theodolite superior to the sextant in measuring the angle between two places of different elevation?
12. Explain the method of finding your place in a survey by “interpolation,” the principal stations being fixed: 1st, by taking the magnetic bearings of two fixed points; 2nd, by observing the angles formed between three fixed points, all on the same side of the observer.
13. Give a form of field book for entering the measurements of a base line, and the angles to the principal stations.

14. In the fig. A B C D the base A B is measured and found to be 5365.001 feet ; the following angles are also measured :



At A, $\angle BAC = 30^\circ 47'$	At B, $\angle CBA = 45^\circ 14' 50''$
$\angle CAD = 104^\circ 56' 40''$	$\angle CBD = 98^\circ 58'$
At C, $\angle BCD = 59^\circ 12' 44''$	At D, $\angle BDC = 21^\circ 49' 16''$
$\angle ACD = 44^\circ 45' 26''$	$\angle CDA = 30^\circ 17' 54''$

From these data find the lengths of CD, AD, BD, AC, BC, in feet, and draw the figure correctly to the scale of 6 inches to a mile.

EXAMINATION IN SURVEYING.

Afternoon Paper.—December 1867.

Note.—Write your name at the top of the accompanying plan, and of each of the papers you hand in in reply to the following questions. Candidates must not communicate with or assist each other. Work on this paper must close at the termination of the sitting.

1. Consider the accompanying map as a tract of country of which you are required to make a trigonometrical survey on a scale of six inches to the mile. Show how you would proceed, and state what instruments you would use in the different portions of the work.

The plan may be drawn over in any way you think proper in illustration of your procedure, the proposed base line being represented by a thick red line and the triangulation by thin red lines.

2. Enlarge the plan on a separate piece of paper to the scale of four inches to the mile, or as much of it as will come on your paper, measuring from the lower right-hand corner of the map both ways ; and show the roads, buildings, and features of the country. (Great accuracy in filling in the details is not expected, as the time is limited.)

3. Draw the scale at the foot on the diagonal principle, showing tens, fifties, hundreds, and thousands of yards.

4. Shade-in the hills on the enlarged plan with Indian ink, on the horizontal system, as accurately and neatly as the limited time at your disposal will admit of. (You should aim rather at giving a good general idea of the country, than at following exactly each undulation of the ground.)

5. Colour-in the roads, streams, buildings, and sea, on the enlarged plan.

6. Compile from the enlarged plan a field-book of a supposed transverse survey with compass and chain of the road from Emlaghmore Bridge round by the National School, and back by Emlaghmore House to the place of starting. Take the measurements and angles from the plan.

7. Calculate the area of the land enclosed by these roads.

Note.—On the completion of answers to the above questions, the remainder of the afternoon sitting will be devoted to the *viva voce* examination of the candidates in the practical use and adjustment of instruments.

QUESTIONS ON LEVELLING AND PRACTICAL SURVEYING.

December 1867.—Morning Paper.

Note.—You are particularly requested to write legibly, and to answer the questions as concisely as possible. Prefix the number of the question to each answer, and write your name at the top of each of your papers. Candidates must not communicate with nor assist each other. Questions remaining unanswered at the close of the sitting cannot be taken up again afterwards.

1. State the different instruments used in levelling, and the class of operations to which each method of levelling is suitable.

2. What

2. What is the advantage of setting up a level at equal distances from the forward and back staves?

3. Describe the operation of running contour lines, and state the objects for which a contoured survey is required.

4. In taking a round of vertical angles, why is it desirable to level the telescope by the attached level, and read the index error before taking each angle?

5. Explain the manner of making trial sections for a proposed line of road. What do you consider the maximum gradient for a cart-road and for a mule-road?

6. State how you would survey a river above and below a proposed crossing, and calculate the water-way required.

7. Give the form of field-book you have been accustomed to use when levelling, and fill it in with a few imaginary readings briefly explaining the operation.

8. Assuming the mean diameter of the earth to be 7,916 miles, show that the effect of curvature at 1 mile distance is 8.004 inches, or nearly the square of the distance in chains divided by 800.

9. Describe the mode of making a special survey for the exact measurement of areas, and give a description of the computing scale for ascertaining mechanically the contents of enclosures.

10. Explain the different methods of laying down a railway curve on the ground, 1st, by measurements and offsets; 2nd, by angles taken simultaneously from two theodolites placed at the opposite ends of the curve.

11. Let P be the centre of a station, S a satellite station at 20 feet distance, from which the angles PSA , PSB are observed, and found to be $PSA = 80^\circ$, and $PSB = 210^\circ$. Given also $PA = 2,500$ feet, and $PB = 3,000$ feet. Find the value of the angle APB .

12. Explain how you would obtain a rough section of a piece of undulating ground without a levelling instrument.

13. Show how the latitude of a place is found by a meridian altitude of the sun, and find it in the following case:—The meridian altitude of sun's lower limb was $43^\circ 18'$, the observer being north of the sun; assume the sun's semi-diameter at $16'$, refraction at $1'$, and the sun's declination at $22^\circ 26' N$.

14. Describe the mountain barometer and its application, and give a formula for ascertaining heights by the barometer, applying it in the following case:—At the summit of Snowdon the barometer read 26.409, the detached thermometer 46° , the attached thermometer 50° . On Carnarvon quay the readings were 30.091, 60° , and 60° , respectively. Find the difference in height between the two stations.



EXAMINATION IN PLOTTING AND PLAN DRAWING.

December 1867.—Afternoon Paper.

Note.—Write your name at the top of every paper you hand in. Candidates must not communicate with or assist each other. Work on this paper must close at the termination of the sitting.

1. Plot a section from the accompanying Field Book of Levels. The horizontal scale of the section to be 400 feet to the inch; the vertical scale to be 40 feet to the inch. Fill up columns of rise, fall, and reduced level, the datum being assumed at the sea level.

Field Book of Levels.

No. of Station.	Distances in Feet.	Back Sight.	Fore Sight.	Rise.	Fall.	Reduced Level.	Remarks.
Commenced at bench-mark, 171·61 above sea level.							
1	197	3·92	6·19				
2	217	·17	10·90				
3	276	2·51	7·91				
4	347	2·74	11·16				
5	396	·20	7·76				
6	427	·80	7·24				
7	524	3·74	4·18				
8	527	3·22	5·45				
9	326	3·95	10·48				
10	238	4·07	2·06				
11	250	5·55	3·45				
12	414	5·30	2·21				
13	401	10·25	3·77				
14	164	7·08	2·03				
15	233	3·26	7·80				
16	227	2·68	3·55				
17	154	9·02	2·68				
18	257	7·09	1·11				
19	300	10·83	1·18				
20	297	9·69	·74				
21	392	9·25	3·62				

2. On this section plot in a proposed line of road, no slope to exceed 1 in 40; cuttings and embankments to balance each other as nearly as possible, the cross section being assumed horizontal throughout; road 30 feet wide.

3. Draw a plan, front elevation, and cross section of an Inspection Bungalow, containing two main rooms, each about 22 feet by 18 feet, with dressing rooms attached, about 11 feet wide, and a bath room not less than 10 feet square. The building to be completed by an arcaded verandah, nowhere less than 8 feet wide; the plinth to be $2\frac{1}{2}$ feet high, and the main rooms not less than 20 feet to the underside of beam. All other details at your discretion. Scale for plan and section, 8 feet to the inch.

4. Draw the same building in isometrical perspective.

Note.—On the completion of answers to the above questions, the remainder of the afternoon sitting will be devoted to the *viva voce* Examination, in the practical use and adjustment of instruments, of such of the candidates as there may not have been time so to examine on the previous day.

EAST INDIA
(ENGINEERS' ESTABLISHMENT, &c.)

RETURN of the Names of EXAMINERS appointed to examine the CANDIDATES who presented themselves since the last Return, for Admission to the ENGINEERS' ESTABLISHMENT and PUBLIC WORKS DEPARTMENT in *India*; of the Names of the SUCCESSFUL CANDIDATES in Order of Merit; of the MARKS which were assigned on each Subject to every CANDIDATE; and, of the EXAMINATION PAPERS of each SUBJECT; &c. (in continuation of Parliamentary Paper, No. 25, of Session 1867-8).

(*Mr. Adam.*)

Ordered, by The House of Commons, to be Printed,
28 April 1868.

[*Price 2 s.*]

EAST INDIA (GODAVERY RIVER).

RETURN to an Address of the Honourable The House of Commons,
dated 31 March 1868;—for,

“COPIES of the MINUTES and CORRESPONDENCE of the Secretary of State
for *India*, the Governor General of *India*, or any others, relating to the
opening up of the RIVER GODAVERY:”

“And, of the REPORTS and CORRESPONDENCE of the ENGINEERS and others
employed on the Works since the Return presented to this House on the
27th day of April 1864.”

India Office, }
2 April 1868. }

W. T. THORNTON,
Secretary, Public Works Department.



(*Sir Stafford Northcote.*)

Ordered, by The House of Commons, to be Printed,
3 April 1868.

C O N T E N T S.

No.	Date.	From	To.	Subject.	Page.
1.	2 July 1864	- Government of India	Secretary of State	- Projects and Estimates called for	-
2.	4 Aug. „	- Government of India	Secretary of State	- Progress of Works	-
3.	17 Nov. „	- Secretary of State	Government of India	- Expenditure on Works, past and future.	-
4.	26 Jan. 1865	- Government of India	Secretary of State	- Progress Report of Works	-
5.	30 „ „	- Government of India	Secretary of State	- Examination of the Valleys of the Kanhan, Pench, and Wynegunga Rivers.	-
6.	29 April „	- Secretary of State	Government of India	- Construction of Storage Reservoirs.	-
7.	9 Aug. „	- Government of India	Secretary of State	- Progress Report of Works	-
8.	13 Sept „	- Government of India	Secretary of State	- State of past Expenditure, and Prospective Measures.	-
9.	8 Feb. 1866	- Secretary of State	Government of India	- General Review of the subject. Memorandum by Major Haig.	-
10.	9 Dec. 1865	- Government of India	Secretary of State	- Proposed Road from Chanda to foot of Third Barrier.	10
11.	17 Jan. 1866	- Government of India	Secretary of State	- Lieutenant Colonels Anderson and Fife deputed to report on the whole project.	10
12.	9 June „	- Secretary of State	Government of India	- Reply to the above	10
13.	10 May „	- Government of India	Secretary of State	- Progress Report of Works	10
14.	9 Nov. „	- Secretary of State	Government of India	- Progress of Works	12
15.	7 Dec. „	- Secretary of State	Government of India	- Despatch of tugs and barges	12
16.	19 „ „	- Government of India	Secretary of State	- Progress Report of Works	12
17.	8 March 1867	- Government of India	Secretary of State	- Report by Colonels Anderson and Fife. Minutes by Mr. Temple.	12
18.	4 Sept. „	- Secretary of State	Government of India	- General Review of the subject	22
19.	8 April „	- Government of India	Secretary of State	- Progress Report of Works	22
20.	11 July „	- Government of India	Secretary of State	- Report by Major Haig on the Navigation of the Kanhan and Wynegunga Rivers, and increasing the Supply of Water for Irrigation in the Godavery Delta.	22
21.	31 Oct. „	- Secretary of State	Government of India	- Reply to the above	22
22.	17 Aug. „	- Government of India	Secretary of State	- Progress Report of Works	22
23.	23 Nov. „	- Secretary of State	Government of India	- Reply to the above	20
24.	29 „ „	- Government of India	Secretary of State	- Surveys for further Works	20
25.	29 Feb. 1868	- Secretary of State	Government of India	- Reply to the above	22
26.	14 Dec. 1867	- Government of India	Secretary of State	- Same subject	22
27.	20 „ „	- Government of India	Secretary of State	- Report of Operations during third quarter of 1867.	22
28.	29 Feb. 1868	- Secretary of State	Government of India	- Reply to the above	22
29.	4 „ „	- Government of India	Secretary of State	- Progress Reports of First and Second Barriers, Divisions, &c., for half year, ending 30th September 1867.	2

N. B.—It has not been thought necessary to print all the plans. Those only are inserted which illustrate the state of the works at the period. The remaining plans have been deposited in the Library of the House of Commons for the use of Members.

COPIES of the MINUTES and CORRESPONDENCE of the Secretary of State for *India*, the Governor General of *India*, or any others, relating to the opening up of the RIVER GODAVERY :—And, of the REPORTS and CORRESPONDENCE of the ENGINEERS and others employed on the Works since the Return presented to this House on the 27th day of April 1864.

— No. 1. —

(Public Works Department.—No. 48 of 1864.)

To the Right Honourable Sir *Charles Wood*, Bart., G.C.B., Secretary of State for India.

Sir,

Simla, 2 July 1864.

WITH reference to your Despatch, No. 18, of 25th April last, regarding the Godavery Navigation Works, we have the honour to forward for your information the enclosed correspondence with the Chief Commissioner of the Central Provinces on the subject, from which it will be seen that the projects and estimates referred to in the 3rd paragraph of your Despatch have not yet been submitted, and that we have found it necessary to call for them in a peremptory manner, with an intimation that the extreme step of stopping the works until the required projects are submitted may be forced on us if further delay is permitted to take place.

2. The papers now forwarded, though dated in November and December last, only reached this office at the end of April 1864, owing to a general mis-carriage of business in the office of the Public Works Secretary to the Chief Commissioner, the causes of which are now under investigation.

3. It will be seen from our Secretary's letter, that the Chief Commissioner has been requested to submit at an early date a concise report, with illustrative plans, showing the progress of the works up to date, and to submit such a report half yearly in future.

We have, &c.

(signed) *John Lawrence.*

H. Rose.

R. Napier.

H. S. Maine.

C. E. Trevelyan.

W. Grey.

G. N. Taylor.

Enclosure 1, in No. 1.

(No. 1239.)

From Lieutenant Colonel *A. Impey*, R.E., Secretary to Chief Commissioner, Central Provinces, in the Public Works Department, to Secretary to Government of India, Public Works Department, with Governor General.

Office of Secretary, Chief Commissioner,
Central Provinces, Public Works Department, Nagpoor,
17 December 1863.

Sir,

I AM directed to submit, in reference to the correspondence marginally noted, a letter from Captain Haig,* Superintending Engineer on the Godavery, regarding the future prospects of the navigation works on that river.

Chief Commissioner's Report on the River Godavery.
Government reply, No. 1388, dated 14th July 1863.
*No. 616, dated 16th Nov. 1863.

2. This Despatch has not materially modified the views submitted by Mr. Temple in his report on the Godavery; but still, from Captain Haig's great services in connection with this project, his opinions deserve every consideration. I am accordingly to offer, on

O.9.

A 2

Mr.

Mr. Temple's part, various remarks in detail on the several points of the Despatch now forwarded.

3. From his 3rd to his 15th paragraph Captain Haig adduces arguments to show the immense advantages of opening the navigation, not only up to the third barrier, but past that point into the valley of the Wurdah and the country of Nagpore Proper; and to prove that this, which may be called the extreme upper section, is really the finest and most important part of the whole project.

Now Mr. Temple fully concurs in all this. Indeed, he hopes he has succeeded in demonstrating this in his own report (*vide* paras. 104 to 118). But it was then shown that there are not real data for this portion of the project, and no reliable plans; until these shall be, it cannot be recommended; and this view is not affected by the Despatch now forwarded.

4. In Mr. Temple's report it was shown that, even without the Wurdah navigation, the Godavery Proper navigation would still be very valuable to the country, and ought, under any circumstances, to be prosecuted. That view is still unchanged; the reasons for it are before Government, as expressed in the report above mentioned.

5. In his 15th paragraph Captain Haig very justly goes on to say, "the question regarding the Wurdah above the third barrier is, Can it be rendered navigable?" He then proceeds to show in general terms, paras. 15 to 18 inclusive, that this object can or may be effected by a series of dams. Hereon the Officiating Chief Commissioner has only to remark, that while, on the one hand, Captain Haig's professional authority deserves every respect, still the scheme cannot be recommended on merely general grounds. It should be explained in specific terms. The number of dams should be stated; their possible sites should be selected; their precise effect should be calculated; their probable cost should be estimated. Then, and not till then, can the Officiating Chief Commissioner be expected to offer an opinion. Meanwhile, as no details of the sort can be given, it seems to be hardly necessary to maintain a general discussion; on the contrary, more harm than good would perhaps be done if attention were to be drawn to those parts of the project which are unavoidably vague or indefinite, and divested from those parts which are certainly practicable, and which ought to be carried on with energy.

6. Thence, in his 19th and 20th paragraphs, Captain Haig makes a general estimate of the probable cost of the works required for the third barrier. Now on this point the Officiating Chief Commissioner has no particular reason to doubt the correctness of the estimate given. But, after all, Captain Haig only presents it as a general calculation, which may or may not agree with the regular detailed estimates, when they shall come to be made. But here again the Officiating Chief Commissioner cannot but doubt the usefulness of such general calculations. At this stage of the proceedings no one doubts that the third barrier work is practicable, and that *it will* cost from 12 to 15 lakhs and upwards. But more than this cannot be said. Such general calculations are inevitably fallacious everywhere, but they are peculiarly so on the Godavery; for on this river, in every instance, the general calculations have been exceeded by the regular detailed estimates. This circumstance does not reflect at all upon the skill or foresight of the engineers. The fact is, that in such a primitive country as the Godavery Valley, the condition of things is in transition; the progress of work itself affects the range of prices, and the relation between supply and demand. Thus it happens that the engineers cannot be expected to really foresee what a work will cost until the plans and estimates come to be made; and even then it is but too probable that the regular estimates will ultimately be exceeded. On this part of the subject, then, the Officiating Chief Commissioner can only say that it appears almost premature, in the absence of plans and estimates, to speculate on the cost of the third barrier works.

7. The same remarks apply to the general calculation of the cost of some six anicuts in the Wurdah, which Captain Haig expects will amount to between nine and ten lakhs.

8. In his paras. 24 to 28 inclusive, Captain Haig enters into various considerations relating to the proposed system of increasing the water supply of the Wurdah at certain seasons, by means of water stored in reservoirs. The Officiating Chief Commissioner is hardly able to offer a clear opinion on this subject, but he is disposed to rely on Captain Haig's professional knowledge and judgment.

9. But one practical question which obviously presents itself to the Officiating Chief Commissioner is, whether there are suitable sites for this purpose to be found or not. On this point I am to refer you to this office letter (No. 920) of the 18th September last. It was therein shown how Mr. Hanna (an officer specially deputed for this inquiry) could find only *one* site likely to suit for a reservoir for the Wurdah. But it was also apparent, that to feed the Wurdah from a reservoir at *that* point would involve works of great expense and difficulty; greater perhaps than Government would be prepared to undertake.

10. In his letter now under consideration (paras. 31 to 33), Captain Haig suggests that sites should be sought at points nearer to the Wurdah, in the valleys of the streams named the Dham, the Bhoree, the Wunna, and the Kurruk. No doubt if the sites could be found in *these* places where reservoirs *with a sufficient quantity of water* could be constructed at moderate cost, then much difficulty would be removed. From what he has seen of these places,

places, the Officiating Chief Commissioner believes that at these places reservoirs might be constructed which would be valuable for irrigation. But he fears that such reservoirs would not attract an amount of water sufficient for supplying the Wurdah, and he knows this to be Mr. Hanna's general opinion. The main question is whether the drainage, which might be accumulated at these spots, would provide water enough for this purpose, and it is feared that such would not prove to be the case. These sites, however, have not yet been examined in sufficient professional detail to justify a perfectly confident opinion; and therefore the full examination of these sites is a primary desideratum.

11. Having thus touched on the matters relating to the upper sections of the river, that is, chiefly to the Wurdah, Captain Haig, in his 34th paragraph, adverts to the lower sections; that is, to the first barrier. He there shows the difficulties experienced in carrying on the works at that barrier with reasonable speed, owing to scarcity of labour. The works now planned are calculated to render the barrier passable for all the year round. But while these larger and permanent works are being gradually constructed, Captain Haig would desire intermediately to construct lesser works, partly of a temporary character, which may render the barrier passable for four months in the year. These lesser works, if the Officiating Chief Commissioner understands aright, can be made to fit in with the larger ones. If these several objects can be attained, the Officiating Chief Commissioner would fully concur in the views of Captain Haig; but whether this revised proposal be perfectly practicable must depend on detailed plans and estimates, which the Officiating Chief Commissioner has accordingly desired Captain Haig to submit.

12. Having thus discussed the immediate question regarding the first barrier, Captain Haig summarises (his 41st para.) his views upon the whole subject of the Godavery, and I am now to state the Officiating Chief Commissioner's opinion upon each of the points in order—

13. Firstly, then, Captain Haig thinks that the extension of the navigation above the third barrier up the Wurdah is an essential and integral part of the project; now the Officiating Chief Commissioner admits that it is a very important part, but still not an absolutely essential one. No doubt it would be best to open all the three barriers, but if this cannot be done all at once, then it would be possible, for the reasons given in Mr. Temple's Godavery report, to open the first or second barriers primarily, leaving the navigation of the third barrier for further consideration.

14. Secondly.—Captain Haig thinks that the works required for the third barrier and the Wurdah present no engineering difficulties. The Officiating Chief Commissioner does not in the least mean to controvert this, but he cannot of course affirm it until detailed plans and estimates shall be submitted.

15. Thirdly.—Captain Haig desires that the practicability of supplying the Wurdah with water stored in reservoirs should be investigated; in this the Officiating Chief Commissioner entirely concurs.

16. Fourthly.—Captain Haig desires that the works for the first and second barriers should, in the first instance, be limited to what is required for a navigation of four months, if this shall be found practicable, and if such works can be made to fit in with the larger works to be subsequently constructed, the Officiating Chief Commissioner would be prepared to advocate Captain Haig's proposal in this respect.

17. Fifthly.—Captain Haig desires that the navigation from Hinghunghat, that is, from the Wurdah, having first been rendered practicable for four or five months, the works required for its gradual extension to a longer period of the year should proceed *pari passu* at all points along the river. The Officiating Chief Commissioner regrets that he cannot altogether concur in this proposal for the reasons given in his Godavery report, and in this despatch he thinks that the works at the first and second barriers should be proceeded with; but that no navigation works should be in any way commenced at the third barrier until the plans are completed, not only for the third barrier itself, but also for the navigation of the Wurdah above it.

18. In his 42nd para. Captain Haig summarises the measures which he would recommend for the carrying out of his views; to each of these also I am to advert briefly in order—

19. Firstly.—Captain Haig proposes that all resources at the first barrier should be concentrated upon the work of opening a four months' navigation. The Officiating Chief Commissioner would be prepared to recommend this, provided that the practicability of these lesser works shall have been shown by plans and estimates.

20. Secondly.—Captain Haig proposes that the works at the second barrier should be carried out on the plans recently submitted. I am to explain hereon that this plan does not apparently refer to any regular plans and estimates, as none such have been received here, but a general report has been received to the effect that Captain Haig is now inclined to abandon the project of passing round that barrier by a canal, and to revert to the original project of forming anicuts and locks in the barrier itself. On this the Officiating Chief Commissioner can only say that the question can hardly be effectually considered until the plans and estimates shall be received.

21. Thirdly.—Captain Haig proposes that a competent officer be appointed for the preparation of plans and estimates for a boat canal at the third barrier; in this proposition the Officiating Chief Commissioner entirely concurs.

22. Fourthly.—Captain Haig proposes that, as soon as the plans of the third barrier shall have been sanctioned, the funds available by saving at the first barrier should be applied to the execution of works at the third barrier; now, as already submitted, the Officiating Chief Commissioner would deprecate plans and estimates for the third barrier being sanctioned until plans and estimates for the navigation of the Wurdah also shall have been sanctioned, and he would dissuade Government from spending any money upon navigation works at the third barrier until this entire question shall have been settled. If Government were to allow money to be spent on navigation works at the third barrier, then it would be virtually committed to any works which might subsequently be found necessary to render the Wurdah navigable, and the Officiating Chief Commissioner could not recommend that Government should be thus committed until full inquiry shall have been made. Under these circumstances it may not be necessary to discuss the application to the third barrier of funds now allotted to the first.

23. Fifthly.—Captain Haig proposes that, simultaneously with the works at the third barrier, the construction of reservoirs for the Wurdah be undertaken. The Officiating Chief Commissioner cannot offer an opinion on this proposal, inasmuch as the inquiry is not sufficiently advanced to show whether the project is practicable or not.

24. Sixthly.—Captain Haig proposes that no works should be undertaken in the Wurdah itself until the practicability of the reservoir system has been proved. The Officiating Chief Commissioner concurs in this.

25. Seventhly.—Captain Haig proposes that the clearance of rocks, protection of banks, &c. &c., along the whole river *below* the third barrier be estimated for on a plan which he will submit hereafter. The Officiating Chief Commissioner has no particular remark to make on this, except that he has no doubt but that something of the kind will be necessary, and has always been understood to be necessary.

26. Eighthly.—Captain Haig proposes that, while the lesser works at the first barrier are prosecuted, the greater works should be proceeded with, though at a less rapid pace. The Officiating Chief Commissioner would have no objection to this, provided that the lesser work should have been approved.

27. In his 43rd para. Captain Haig adverts to the engineering staff required. It will be in the recollection of Government that an experienced executive engineer is required to succeed Mr. B. Schmidt. A good assistant is also needed in succession to the late Mr. Pullen. Captain Haig remarks that a competent officer is required to prepare plans of the works at the third barrier and for the reservoirs for the Wurdah, and he asks for the services of Mr. S. Hanna now employed at Nagpoor as Superintendent of Irrigation. The Officiating Chief Commissioner would observe that Mr. Hanna is now employed in inquiries relating to schemes of irrigation, which might prove of great importance to the Nagpoor Province. Mr. Hanna could not well be spared from this work, but he could be quite the fittest officer to prepare plans for the reservoirs for the Wurdah.

The Officiating Chief Commissioner would keep the inquiries regarding reservoirs distinct from plans for the third barrier and for the bed of the Wurdah, inasmuch as there would be probably a distance of upwards of 100 miles between the barrier and the reservoirs. He would therefore strongly recommend that a special officer skilled in hydraulic works be separately deputed to make plans for the navigation of the Wurdah itself and of the third barrier. He is more sanguine regarding the practicability of constructing anicuts and locks in the Wurdah itself than of forming reservoirs.

29. In his 44th para. Captain Haig gives a general statement of the probable cost of works that are necessary for opening the navigation of the Godavery and Wurdah for four months in each year, which he estimates at about 30 lakhs. The Officiating Chief Commissioner regrets that he is not in a position to offer any opinion whatever upon this possible expenditure. He would, however, be inclined to suppose that the real cost would prove to be much more.

Having thus analyzed the various opinions contained in Captain Haig's despatch now transmitted, I am to state that if by his various arguments Captain Haig means to vindicate the importance of the Wurdah navigation, and to make out a strong case for inquiry regarding its practicability, then the Officiating Chief Commissioner entirely concurs with him. But if Captain Haig means to say that Government should now be generally committed to undertake the navigation of the third barrier and the formation of reservoirs for the Wurdah, without specific plans for the entire project being furnished, or that Government should be committed to navigation works at the third barrier before specific plans for the navigation of the Wurdah also should have been furnished, then Mr. Temple would be constrained reluctantly to dissent from either of the above views. As previously explained, the Officiating Chief Commissioner would not spend anything upon navigation works above the second barrier, or rather above the *foot* of the third barrier, until the whole question of the Wurdah shall have been settled. At present all that the Officiating Chief Commissioner can recommend is the construction of a metalled road from Chanda to the *foot* of the third barrier. But he admits, as fully as Captain Haig could possibly

possibly desire, the importance of the Wurdah navigation, supposing that it could be effected at a reasonable outlay; and therefore would cordially support inquiries to be made with a view to deciding this question. In the present stage of the matter he cannot recommend the undertaking of any navigation works beyond those already recommended in his general report of the Godavery.

In concluding this despatch, the Officiating Chief Commissioner would observe that, as navigation works at the third barrier and on the Wurdah would come into direct competition with the Great Indian Peninsula Railway, it would be apparently proper that the traffic availing itself of such works (if they be constructed) should be certainly charged with full tolls to prevent even the semblance of the river route being favoured at the expense of the railway route. The tolls would of course be fixed on consideration relating solely to the navigation works. But the fact of their being levied would place the two routes so far upon an equality of treatment.

Enclosure 2, in No. 1.

(No. 616.)

From Captain *F. T. Haig*, R. E., Superintending Engineer, Upper Godavery Circle,
to Secretary to Chief Commissioner, Nagpoor.

Upper Godavery Circle,
Superintending Engineer's Office,
16 November 1863.

Sir,

With reference to your letter, No. 866 of 27th August, I have the honour to submit my views upon the question whether the improvements contemplated or in progress upon the Godavery shall be limited to the rivers below the third barrier, or whether they shall embrace the navigable part of the Wurdah above that point. The Chief Commissioner, in his report of 23rd January 1863, has recommended the former course. The Government of India, while generally coinciding in his views, nevertheless desire that this question shall be made the subject of further investigation.

It is, in my opinion, a fundamental one, intimately connected with the success of the whole project, and therefore deserving of the most careful consideration.

2. The Chief Commissioner's hesitation to recommend the prosecution of the works proposed for the third barrier arises chiefly from his doubts as to the practicability of navigating the Wurdah above that point. The original anticipations with regard to this river have not been confirmed by subsequent observations. It is found to be navigable for three months only, and that with intervals of interruption, which render it in its natural state of little practical use for the purposes of communication. The Chief Commissioner further considers the method of improvement suggested for remedying its defects of questionable efficacy, and that no reliable estimate can now be formed of its probable cost. Believing the works proposed for the two lower barriers to be practicable, at a moderate outlay, to be adapted to the objects in view, and therefore likely to be successful, while this has yet to be proved for those suggested for the third barrier and Wurdah, he recommends that the execution of the latter should for the present be suspended, and that our efforts should, in the first instance, be directed to the prosecution of the former, which, if completed, Mr. Temple considers will secure at least a part of the advantages sought for in the original scheme.

3. The question, then, that I have chiefly to consider is this, can the Wurdah above the third barrier be rendered navigable, and at what cost?

Before, however, entering upon it, I beg to submit some remarks upon the comparative value to the country of the two projects between which our choice lies, viz., that which would limit the water communication to the rivers below the third barrier, and that which, as originally intended, would extend it at least to Hingunghat. I cannot but think that, if this part of the subject had been more considered, the idea of making Moyellee the head of navigation would never have been entertained until the fullest investigation had proved the utter impossibility of making use of the river above that point.

4. Two objects may be said to be in view in opening the Godavery, to establish chief communication between the inland districts of its valley and the sea, and to obtain some adequate returns from the outlay required for this purpose. The question then is, how far those objects are likely to be attained if the navigation stops at the third barrier. The Chief Commissioner shows that the limits of the trade basin of the river improved only to this extent are not likely to extend beyond Hingunghat on the north, Raepoor on the east, and an irregular line to the west and south, including a strip of the Nizam's territories along the right bank of a width of, say, 100 miles. The only parts of this great tract that can be called either populous or productive are the Wurdah districts south of Hingunghat, the districts round Raepoor at a distance of 150 miles from the river, and some portions of the Waringal and Elgundal Circars. Now if we come to consider in what proportion these three divisions of the country are likely severally to contribute to the trade of the river within a moderate time, it is quite evident that our attention must be mainly directed to the first. Many years must elapse before a good road can be constructed in the direction of Raepoor; and even when made, the cost of 100 to 150 miles of carriage by it will be a

serious check upon the traffic of those districts with the river. In the Nizam's territories, had government will do much to diminish the effects of good roads; and though, no doubt, these will be important contributions to the river traffic from that part of the country, it was certainly not with reference to it that the project of opening the Godavery was first entertained, and it would be unwise to place much dependence upon the returns from increased intercourse with it in its present somewhat barbarous state.

5. Unquestionably, therefore, the country of all others likely to reap the greatest advantage from the river, and to yield the largest and speediest returns, is that which was originally aimed at when the project was first started, and which the comparative adaptation to navigation of the different tributaries of the Godavery so distinctly and unmistakably indicates the rich and populous valleys of the Wurdah and Wyne Gunga. The line of least descent in the whole valley of the Godavery is that which follows the course of the Wurdah and Pranhita. It is consequently up to it that navigation may be most advantageously extended, and the tracts into which it leads are at the same time those which the physical characteristics of the river render most easily accessible, and the ones politically and commercially of the greatest importance.

To omit it, therefore, or to make it only a secondary object in developing the project, would be a radical mistake, attended with disastrous effects upon the whole scheme.

6. Now, if Moyellee be made the head of navigation, only a corner of the important tract of country thus indicated will be affected by the improvement, or derive any benefit from it. In this case the cost of the land transport will be such an enormous addition to that of the water line that, as the Chief Commissioner shows, the river will attract no traffic from any point further north than Hingunghat. In other words, the limits of the trade basin in that direction may be described from Moyellee as a centre with a radius of 115 miles, instead of with one of 230 miles, were Hingunghat the terminus, or with one of nearly 300 miles if a little canal communication were opened northwards in connection with the river. It needs but a cursory examination of the map to show what an immense extent of some of the most valuable and productive country in Central India will thus be lost to the river, contributing nothing to its traffic, and being itself deprived of the benefits of the communication. The trade basin north of the third barrier would, in fact, be only one-fourth or one-fifth in this case what it would be in the other, and thus by far the greater part of the very country which of all others it should be our object to reach, would be shut out altogether from the river and its port.

7. But let us glance for a moment at the extent to which the proposed curtailment of the original project is likely to affect even the limited portion of the Wurdah and Wyne Gunga valleys, which it would reach.

The Chief Commissioner shows that the cost of carriage to Cocanada from Hingunghat by water alone might be Rs. 6. 15. 3. per ton, while from the same point to Moyellee by land, and thence to Cocanada by river, the cost would be Rs. 26. 6. 3. This is to say that the intervention of this one piece of land carriage would increase the cost of transport *fourfold*. To what extent is that likely to operate upon the traffic? Take any line of transit in India, or the world, and increase the rates of transport in this proportion, and the effect would be, in most cases, the annihilation of the traffic, or *decrease* them in the same ratio, and the increase may be not four, or five, or tenfold, but twentyfold.

8. The substitution of land for water carriage on this part of the line must therefore inevitably be attended with the sacrifice of nine-tenths of the advantages which the country would otherwise derive from the Godavery scheme. But such a state of things was never heard of. Never surely in the history of communications was there such an anomalous proceeding known as the opening of a line of transit 400 miles in length, 100 of which was left in such a miserably imperfect condition that the cost of carriage on it actually increased that of the whole line fourfold. The difficulties of construction, or the poverty of the Government or corporation carrying out the improvement, must have been great indeed if ever an attempt of the kind ended in such an abortion. It will be a lamentable result of our exertions to open this river if we succeed in bringing the means of really cheap carriage only to the frontier of the richest portion of its valley, and fail to carry them into the heart of it. Is the thinly-peopled forest tract lying along 300 miles of the left bank to have the means of export for its produce at three to four rupees a ton, while the rich valleys of the Wurdah and Wyne Gunga are to have nothing cheaper than 20 to 30 rupees? Why should such a tax be imposed upon the most populous and productive part of the whole valley? There is no help for it, of course, if the further extension of the water line is impracticable, but surely this must be determined beyond all question before we can resign ourselves to such a failure. And with regard to cost, let us remember that we are proposing to spend 6,000 rupees a mile on 200 miles of road to Raepoor. Is it not a question whether the same amount expended on 100 miles of river at 12,000 rupees a mile would not yield incomparably superior results? After the road has been made, the cost of carriage by it will be very heavy, but supposing the river opened instead, what a prodigious stimulus might be given to the whole country it would penetrate, when such extremely cheap transport had been rendered practicable between the very heart of it and the port.

9. Of course it may be said that the road would take a generation to construct, while the expenditure in the river would be incurred in the space of a few years, and that the Government

O.9.

in opening the river no further than to Moyellee, we fail to reach the country which of all others would yield the largest and speediest returns, we leave undone the one piece of the line most certain to make the expenditure on the other parts remunerative.

13. Moreover, it is quite a mistake to suppose that water carriage is to cease where the river navigation ends.

The valleys of the Wurdah and Wyne Gunga, south of the Satpoora Range, admit, I believe, of canal communication through every part, and there can be no doubt, that if irrigation is carried out on any really comprehensive scale, such as the Chief Commissioner now seems to contemplate, navigation can be very easily provided in combination with it. Now, such a system of canals would naturally link itself with the river, but it certainly cannot do so at Moyellee without the works at the third barrier are constructed; and how wretchedly incomplete would such a system of canals be without the river to connect them with the port. Let us for a moment suppose the single district of Rajahmundry placed between the Wurdah and Wyne Gunga with all its present improvements, but 26 rupees a ton added to the cost of carriage to Cocanada now averaging about $1\frac{1}{2}$ rupees per ton (would it bear its present tax of 5-8 rupees an acre, or yield its present revenue about half that of the whole Central Provinces).

14. I will not further enlarge upon this subject, because I cannot believe that any very lengthened discussion of it can be necessary. I think its importance has been underrated, and that a more correct appreciation of the value of really cheap transport to this country would have shown in a much stronger light the extreme defectiveness of any such restricted scheme as would confine the navigation of the Godavery to the rivers below the third barrier, and I am persuaded that the more the question is considered the more anxiously will investigation be directed to the possibility of extending the navigation into the Nagpoor district alone. This is the next point I have to notice.

15. The question regarding the Wurdah above the third barrier is, can it be rendered navigable? Not, can it be made so by means of reservoirs. That is a subordinate question with which we have at present nothing to do, and may be dismissed altogether from the mind.

We are now fully acquainted with the main feature of this river. Levels were taken up its bed to Chanda in 1855, and again last year a double line was carried up to the mouth of the Wunna Nuddee, and thence up that stream to Hingunghat.

The railway levels give the elevation of its bed above the sea at Natchengaon.

I have navigated it myself nearly as far as the Wunna in the month of September.

The fall in its bed between this point and the third barrier, a distance of 100 miles, is 105 feet, or say one foot per mile.

The slope is, however, greater in the upper part than in the lower.

A pool of about 16 miles in length extends in summer immediately above the third barrier, and the rise from the latter point in the first 40 miles is only 20 feet, or six inches per mile.

The width in this portion is about 400 yards from bank to bank. It then rapidly diminishes, and from the Pyne Gunga upwards, is only 150 to 200 yards.

Only occasional isolated rocks are met with, excepting at one place a little above the Pyne Gunga, where for a length of 300 yards the river has cut its summer channel through solid rock, the passage being about 25 yards wide and of great depth. The rock appears to be here, and nearly everywhere else, a softer sandstone.

Just below the mouth of the Wunna Nuddee, a solid mass of trap rock leads the river across, and there is a sudden descent here of 13 feet.

16. The Wunna Nuddee has a rise in its bed of 48 feet in 25 miles, between the mouth and Hingunghat, or at the rate of two feet per mile.

Above the Wunna the Wurdah is more or less rocky, but we are not so well acquainted with the state of its bed as with that of the river below.

It has a rise of 248 feet to Natchengaon, a distance of 64 miles, or at the rate of four feet per mile.

The Wurdah therefore between the Wunna and the third barrier is, so far as its slope and width are concerned, not only a navigable river, but far superior in respect of these two essential points to any part of the Pranhita or Godavery below.

These widths are of course very much greater, while it is only in isolated portions that their slope is as low as one foot per mile.

The one defect of the Wurdah is the want of water. The natural supply is not sufficient to keep up an uninterrupted navigation for even three months, and the question is, how to remedy this defect.

17. In other countries wherever rivers are not navigable by nature have been rendered so by art. The means employed has always been the construction of a series of dams forming a succession of still water pools, the communication between which is effected by means of locks. Numerous examples of this system are to be met with, both in Europe and America. The Severn, the Shannon, the Bana, are the most prominent instances in Great Britain: the Seine, the Oise, and the Yonne, in France, and in America, the Lehigh Schuylkill, Monongahela, Green River, and Muskingum.

Several of these are both wider and have a more rapid descent than the Wurdah, in other words possess conditions less favourable for improvement; the natural supply of water

water in some is little better than in this river, while their floods are higher and more formidable.

Now these facts are incontrovertible, and perfectly decisive as to the practicability and suitability of a similar method of improvement for the Wurdah. Whatever questions may be raised, or doubts entertained as to the success of the work in progress for the improvement of the navigation below the third barrier, there cannot be a shadow of a doubt that the river above that point may be made perfectly navigable. Either this is so, or there is more truth than is commonly supposed in the old saying that "it is all very well in England, but won't do in India."

18. I give, however, for the sake of illustration, the following details of one of the American rivers so improved, which approaches very nearly in its general characteristics to the Wurdah. I refer to the Monongahela, a tributary of the Ohio; length, 89 miles; total rise, 72 feet; number of dams completed in 1859, four; with a total rise of 31 feet.

The completion of the others had only been delayed by the want of capital, and by the question having been raised as to whether the system of improvement by means of reservoirs, suggested by Mr. Ellet, would not be preferable.

The Wurdah has a length of 100 miles, and a rise of 105 feet.

The dams constructed on the Monongahela were from 500 to 1,100 feet in length. All but one of these required for the Wurdah would be only 500 feet long.

The least summer discharge of the Monongahela is 10,200 cubic yards per hour. I found that of the Wurdah below Chanda, on the 28th April 1855, to be 24,000 cubic yards.

The floods of the Monongahela rise from 30 to 40 feet; those of the Wurdah about the same.

The Monongahela is now navigable for the whole year. Works of a similar character on the Wurdah would have a precisely similar effect. If anything more needs to be said in proof of this, I must wait until objections to it are raised. For the present I assume it as demonstrated beyond a shadow of a question that the Wurdah may be rendered navigable all the year round from the third barrier to the Wunna, or up to Hingunghat itself, by means of works without the slightest pretension to novelty, and of a precisely similar class to those which have been carried out with perfect success on many other rivers. Further, I assume it to be equally certain that the Wurdah may be rendered navigable by similar means to Natchengaoon. If the slope between that place and the Wunna is greater than below, the width is no doubt less, and the facilities for construction are in all probability greater.

19. The next question is, what are the works required likely to cost? But before considering this I must offer a few remarks upon the third barrier works. Some suspicion, I think, attaches to them. The fact that that barrier is the most formidable of the three leads apparently, and certainly not unnaturally, to the idea that the works required will be proportionately formidable and expensive.

But it does not need much consideration of the facts to show that there is really no connection between the two things.

In the first place the anicut which it is proposed to throw across the river will be built on rock; but instead of 1,200 to 1,700 yards, like those below it, will have a length of only 400 yards. Here is one great advantage.

In the next place, the fall in the bed of the river, four feet per mile, which is greater than at the other barriers, gives this great advantage, that the bed of canal led off from above an anicut at top of the barrier will, if it receives a slope of only a few inches per mile, which is all that is necessary, very soon come on to the surface of the ground; in other words, the excavation which is always most expensive at the head, will be much less than if the ground had a less fall. Then we know at least enough of the country on the right bank, through which some lines of the levels have been carried in connection with the tramroad, to say decidedly that it presents no difficulties whatever, but on the contrary is extremely favourable for the formation of a canal, being very level, with a deep black soil. There is no comparison whatever between it and the country traversed by the first barrier canal; its natural advantages are immensely superior. Whatever, therefore, of novelty or of doubtful utility may be supposed to attach to the works proposed for the Godavery, must be sought for below the third barrier.

Above that point the practicability of rendering the river perennially navigable is as certain as any fact in the history of engineering.

20. Now as to cost. In the first place, I submit that the works required are not of a class *likely* to be expensive; there will not be one single formidable, or even difficult work from one end of the line to the other.

The works on the third barrier canal will be precisely similar to those of all canals, and the anicuts on the Wurdah alone may be made of moderate heights similar to those of the Godavery and Kistna Deltas, as well as other parts of Southern India.

In the next place, the scale on which the works should be carried out must be determined. I would propose to open the navigation for boats and small stern wheel tug steamers only, that is to say, to give the canal a bottom width in the first instance of about four yards, and to make the locks on it and on the river not above 90 feet by 15 feet in the chamber.

Let it be observed that this part of the river is of all others the most favourable for boat navigation; first, because the fall, and consequently current, is so slight; and second, because the width between banks is so much less that towing by rope is more practicable.

At Moyellee the boats would be taken in tow without break of bulk by the steamers in the reach below.

21. In attempting to form an estimate of the probable cost of the works thus sketched out, I will take that of those already executed, and the estimate which, I think it will be admitted, has been most carefully framed for their completion as the basis of my calculations.

The first barrier canal, then, is estimated to cost 6,44,663 rupees, including drainage works, and the expenditure already incurred. This for 23 miles is 28,000 rupees per mile. This is for a canal with a bottom width of eight yards; with heavy flood embankments crossing large nullahs from 25 to 50 feet deep, with half a mile of rock cutting at one place, and a cutting 30 feet deep through a hill at another. The rates allowed are high, higher probably than would be necessary at a place like the third barrier, so much nearer to a populous country, and where labour is more easily obtained.

For the third barrier canal only four yards at bottom, without flood embankments (which there will not be necessary), and including drainage works, I allow 20,000 rupees per mile.

The locks of the dimensions above mentioned would not cost more than 2,000 rupees per foot of lift; those for the first and second barriers, 175 × 25 in the chamber, being estimated at 8,500 rupees per foot. For the anicuts I allow 400 rupees per yard of length, that for the first barrier being estimated at 30 rupees. The height would be about the same. Cut stone might have to be brought from a greater distance on the Wurdah.

The estimate, then, would stand thus:—

THIRD BARRIER CANAL AND ANICUT.

1. <i>Anicut.</i>						<i>Rs.</i>	<i>Rs.</i>
400 yards, at 400 rupees	-	-	-	-	-	1,60,000	
Wing walls -	-	-	-	-	-	6,000	
Entrance lock -	-	-	-	-	-	25,000	
Embankments -	-	-	-	-	-	10,000	
Total of Anicut and Head Works						- - -	2,01,000
2. <i>Canal.</i>						<i>Rs.</i>	
32 miles, at 20,000 rupees	-	-	-	-	-	6,40,000	
Locks, 160 feet, at 2,000 rupees	-	-	-	-	-	3,20,000	
							9,60,000
Five per cent Contingencies	-	-	-	-	-	-	58,000
Sundries -	-	-	-	-	-	-	1,00,000
Total of Third Barrier Works						- - -	13,19,000
<i>Anicuts in Wurdah.</i>						<i>Rs.</i>	
1 Anicut, 200 yards long, at 400 rupees	-	-	-	-	-	80,000	
Wing walls -	-	-	-	-	-	4,000	
Lock, 16-feet lift (high walls)	-	-	-	-	-	42,000	
Five per cent. Contingencies -	-	-	-	-	-	6,300	
Sundries -	-	-	-	-	-	20,000	
Total for One Anicut						<i>Rt.</i> 1,52,300	
Total for Six Anicuts						- - - <i>Rs.</i>	9,13,800
TOTAL						- - - <i>Rs.</i>	22,32,800

Allowing for clearance of rocks in the river bed, the total cost might amount to 23 lakhs.

This estimate has, of course, no pretension to accuracy. That it represents approximately the probable cost of the works will, I think, be admitted by any one who is satisfied that the detailed estimates lately submitted for the first barrier were carefully drawn up, and based on reliable data. My object has rather been to show the necessity for the works as an essential part of the Godavery scheme, and to urge the preparation of detailed estimates of their cost, than to offer any very near approximation to that cost now.

22. The expenditure required below the third barrier will probably be—

	<i>Lakhs.</i>
First barrier, including past expenditure	21
Second barrier	10½
Clearance of rocks, construction of groins, and protection of banks	6
Total	37½

That

That above the same point would be, according to the above estimates for works providing a constant and unfailing navigation for the whole year, 23 lakhs.

Considering that the latter will enlarge fourfold the most important part of the trade basin which the former would open, can we doubt that there would be far more likelihood of adequate returns from the larger than the less outlay.

23. Whatever may be thought of the estimate, I hope I have succeeded in removing all doubt as to the perfect practicability of rendering the third barrier passable, and the river above it navigable. I shall not therefore say any more upon these points, but pass on to consider what is the best course to pursue in regard to the projects thus sketched out; and now that the fundamental question of practicability is settled, I am at liberty to notice any other method of improvement which may be suggested as a substitute for that above described.

24. I will take this opportunity to offer a few remarks upon the subject of improvement by means of reservoirs. I need hardly point out that this system, if practicable at all, is peculiarly applicable to the Wurdah above the third barrier. No one doubts the practicability of making an artificial canal navigable by pouring water into it; and every one admits that nothing is more simple or certain of calculation than the quantity of water required to maintain a certain depth in it.

It is because rivers having broad sandy beds of irregular widths differ from canals, both in the much greater dimensions, and continually varying shape of their channels, that any similar calculations applied to them are received with doubt and suspicion. The case is generally regarded as one not admitting of accuracy of calculation. Without raising any controversy upon this point, I merely wish to remark here that the nearer a river approaches in its characteristics to those of a canal, the less doubt will attach to calculations of the kind. In this respect, then, it will be admitted that the Wurdah, from its gentle fall and the narrowness and great regularity of its channel, would be the most favourable part of the Godavery for a trial of the reservoir system; and it might be found that this method of improvement, while undoubtedly superior in every respect to that by means of dams, supposing it practicable, would be the cheapest of the two.

25. Now, in regard to the calculation of the quantity of water required to maintain a certain depth for navigation, it will be readily understood by any one acquainted with rivers like those of India, that the measurements and observations required for the purpose may be limited to only a very few points along a river. We all know that the water in the dry season flows in a succession of pools separated by shallows, and if the latter are passable we are quite sure that the pools are much more readily so. Again, two or three of the shallows are distinguished by having a greater fall and less depth than the others, and if these are navigable much more will the others be so. Hence, the observations required for the calculations referred to will be limited to only one or two points. I believe that I could myself select one point on this river, the measurement at which would furnish results perfectly conclusive as to the whole river.

No extended series of observations carried on at many different points is therefore necessary. We may station ourselves at one of the worst shoals, and all that has to be done is—

1st. To measure the discharge at that point where there is a certain depth (that which we propose to maintain) in the channel, and

2nd. To measure the discharge at every foot or fraction of a foot as the surface falls below that level down to its lowest summer altitude.

3rd. To note the average number of days that it remains at each particular level below that fixed upon as suitable for navigation. Every one will admit that this simple process will supply data perfectly reliable, and from which the quantity of water which must be annually supplied from artificial sources to maintain a given depth at any particular spot, may be calculated with certainty; and if it may be determined for that particular shoal, then for the whole river, supposing, of course, the shoal to be carefully selected, and to be a fair type of the very worst places of the kind.

26. Here, however, a doubt will probably arise. It may be thought that this would all be true enough were the stream flowing through an earthen or clayey bed, but where it passes over and through such prodigious beds of sand, surely there must be an enormous loss from absorption, and who shall calculate such loss. What reliance therefore can be placed upon calculations which either do not take it into account or offer only a guess as to its amount.

This is, I believe, the main objection in most men's minds to the reservoir system, and its very vagueness gives it the more force.

But a very little consideration will suffice to show that it is purely imaginary. In the first place, what is the amount of absorption and evaporation with the natural stream?

If it is anything to signify, we may certainly conclude that in any given length of the river which receives no contributions from any tributaries, great or small, the stream will be of perceptibly less volume at the lower than at the upper end. *Such is not the case.* On the contrary the very reverse is always observable; I speak of the Godavery; we have nothing to do with the phenomena of rivers wandering through the boundless deserts of Africa.

But it will be replied: Do you mean to say that if in summer when the stream has

shrunk within a channel bounded on both sides by perhaps half a mile of dry and heated sand-banks, you pour in water sufficient to raise its level two or three feet, there will be no absorption by the broad porous margin thus submerged on each side? No, I reply. I say nothing of the kind, and this is precisely where the delusion lies. It appears to be supposed that the intention is to allow the stream to fall below a certain level, and then to pour in water to raise it to that level again. Were this done, of course there would be a certain quantity of the artificial supply carried off by absorption. But no one proposes to do this. The proposal is first to determine at what level the stream has such a depth as we require for navigation, and then as the floods gradually subside to this level, to note when it is attained, and then to pour in water sufficient not to raise it but to prevent its ever falling lower. In this case it is evident that there can be no absorption. The sandy bed on each side has been already thoroughly saturated to the required level before any extra water is added.

27. That the objection above noticed is a common, and perhaps in most men's minds the most important one, was curiously shown in a circular addressed last year by the Government of India both to the officers of the Department of Public Works under that Government, and to the subordinate Governments. In this circular it was recommended that on some of the rivers of India from which large canals have been led off, experiments should be tried in the dry season of the effect produced upon the river by closing the head of the canal, and turning its supply into the river. Or rather, if I remember right, the proposal was to see whether any effect at all would be produced. But it is quite evident that the results of such experiments must have been utterly fallacious, and wholly inapplicable to the question under investigation. In this case there might of course be absorption along both margins of the stream, as its level would be raised, and doubtless, if such results had been observed in any case it would have been considered as a fresh argument against the reservoir system, though without the slightest bearing upon the question. I think, therefore, that this objection about the loss from absorption, and the consequent impossibility of calculating with any certainty the volume of water which would be required to produce a certain effect upon the river, admits of a perfectly conclusive reply; and unless fresh arguments can be adduced to show that there must necessarily be other elements of uncertainty in such calculations, the practicability of rendering the Godavery navigable by this method is deserving of full investigation.

28. That the requisite *quantity* of water can be stored without any very great difficulty is shown by the facility with which favourable sites for the formation of great lakes have been found wherever they have been looked for. Mr. Hanna's report, which I have read with much interest, shows that two or three months' search in one little corner of the Central Provinces, resulted in the discovery of a site where water enough may be stored to them, a stream of 500,000 cubic yards into the river for six months.

29. But my present intention is not to propose a scheme for producing an artificial river of such a volume and deviation as this, but rather to suggest something in a more moderate scale. We have for the present simply the monsoon navigation to deal with. The river below the third barrier is navigable in its natural state for four months, and by the help of groins will probably be made so for six months.

But the Wurdah above the third barrier is only navigable for three months, and that with interruptions.

I wish to suggest that it may be easier and cheaper to extend its period of navigation to four or five months (in the first instance) by means of reservoirs than by constructing a series of dams as above described. Some careful observations would be required to determine the point, but from measurements which I have myself made when going up the river in a steamer last year, I am inclined to think that an average addition to the natural flow of 100,000 cubic yards per hour for four months would be sufficient to give a constant minimum depth of three feet for that time. To supply this, we should have to store nearly 300 millions of cubic yards.

30. I observe that Mr. Hanna assumes 80 per cent. of the rainfall as the probable quantity carried off by the rivers. I should hesitate to take so high a co-efficient, but on the other hand, as 30 inches is stated to be the *minimum* rainfall, I think 24 inches may be safely taken as the minimum off flow in ordinary years. At this rate each square mile of surface would yield two million cubic yards, and to store 300 millions we should require a catchment basin of 150 square miles. It is essential that the reservoir or reservoirs to supply this quantity should not be very far from the head of the navigation, because the stream poured in from the reservoir during the first three months of the season would not be continuous but occasional, and if it has any considerable distance to travel, it may reach the river either too soon, in consequence of a sudden rise of the river, or too late. Sites should, therefore, I think, be sought for in the valley of the Wurdah, and though there appears to be less promise there of suitable ones for storing any very considerable body of water than in the valleys of the Wyne Gunga and its affluents, there would probably be no difficulty in finding a site where a lake of such moderate capacity as now suggested might be formed. Judging only from the map, there appears to be two basins favourable for the purpose, one that of the river which flows past Seyloo into the Wunna Nuddee, the other that of the Kurruck Nuddee falling into the Wurdah near Sonæga.

These rivers drain opposite sides of the hill range north of Hingunghat. A dam on the former near Godah, and one on the latter near Soneega, would ground in the first case the drainage of 135 square miles; in the second, that of 200 square miles. The contents of the two basins, on the above supposition, would then be 170 millions, and 400 millions cubic yards respectively. The northern basin would supply a quantity more like what we should require, and would appear to have the most favourable site for a bund of the two. It might also be found that the navigation below Natchengaon, which a stream from this reservoir would create, would be practicable for boats. On the other hand, the southern reservoir, though the smallest of the two, would have the advantage of being nearer to the head of the navigation, and of throwing its stream down the Wunna into the Wurdah, and the former river would thus be rendered navigable to Hingunghat; its slope being only two feet per mile. Other sites for reservoirs would appear to be practicable on some of the other affluents of the Wunna. If, however, that on the Seyloo river should be found favourable, I would suggest a careful examination of it in the first instance. It seems, at any rate, very probable that we may store up within the valley of the Wurdah water sufficient to perfect the monsoon navigation of that river, and if my present rough estimate of the quantity required be at all correct, and the cost of storage one rupee per 2,000 cubic yards, which is double what Sir A. Cotton is of opinion it should be in the case of great reservoirs, three lakhs would suffice for the purpose. Now this is a very moderate and practicable scheme. It might be carried into execution in the course of a year or two, and would apply a definite and practical test to the reservoir system. I would be content, in the first instance, with the reservoir on the Seyloo river, costing perhaps $1\frac{3}{4}$ lakhs. The water would be equally available for the irrigation of the cotton country below, if not used for the river, so that there can be no question as to any use being found for it.

31. With regard, however, to *cost*, it is important to remark, that a reservoir of this kind, to be used *during the monsoon*, will be much less expensive than one intended to store water for the cold or dry season. In the former case the same *capacity* of reservoir will supply about double the quantity that it would in the latter, because it will be discharging nearly all the time that it is receiving.

In the latter case a bund must be made high enough to retain the whole quantity received during the rains, in the former it need be only high enough to hold about half that amount. In the one case the tank at the end of the 100 days of rain will be quite full; in the other it will have parted with about three-fourths of its total receipts.

In other words, in order to supply an equal quantity of water, a tank for use during the monsoon need be only about half the capacity of one intended solely for the dry season. This is to say, that the bund will be of less height, and the expense less also. This is another advantage of trying this method of improvement upon the Wurdah in the first instance. We should make the experiment at less cost.

32. So far as the interests of the Godavery only are concerned, I would decidedly work out this scheme before attempting anything on so magnificent a scale as the great Lake proposed by Mr. Hanna. Nothing would seem to be more practicable than his project, excepting only the part of it which provides for leading the water into the Wurdah. Discard that, or limit the quantity led into the Wurdah valley to that required for irrigation only, and the project becomes at once feasible, though even then the real poverty of our seemingly magnificent department of public works would probably delay its execution for many years. It would seem that sites for storing the quantity of water that may ultimately be required for the Pranhita and Godavery must be sought for in the valley of the Wyne Gunga. In that case, I think, the attempt to lead the water into the neighbouring valley of the Wurdah should be abandoned; that river should be provided for separately, either by means of reservoirs or by the dam and slack-water system, and the Wyne Gunga water should be discharged by its natural channel into the river below the third barrier.

33. The formation of a great lake, as proposed by Mr. Hanna, for the irrigation of the country south of Nagpoor, is of course a separate question. No doubt the project might be developed into a system of irrigation and navigation which would totally alter the whole face of that country, but for this the aid of private capital must be sought, or the Government must raise the sum required by loan. Mr. Hanna has already sketched out one line of canal in combination with which canal communication between the Wurdah and Nagpoor would be easily practicable, and there seems to be no reason whatever why Hingunghat and Natchengaon should not be connected in a similar manner.

The latter project might be practicable independently of a supply from the Wyne Gunga basin.

34. Leaving now the upper part of the river, before offering any suggestions as to the course of procedure in reference to it which I would recommend, I would direct attention to the state of the works below. At the first barrier we have still about 15 lakhs to spend. The progress here, I am sorry to say, is unsatisfactory, owing chiefly to the deficiency of labour, which threatens to protract the time required for the completion of the works for years. Since May last, the earth-work of the canal, on which from 2,500 to 3,000 coolies have been engaged, has proceeded only at a rate which would require five years more for its completion; and Mr. Schmidt calculates that the losses from people returning to their

homes are such as will require the recruiting annually of 2,400 fresh labourers to maintain even the present numbers. It is true that from June to September being the rainy months, the same outturn of work could not be expected as in dry weather; but on the other hand, with the cessation of the rains the sickly season commences, and soon after its close the increasing heat renders the natives less capable of toil. On the whole, therefore, I fear that any very considerable increase of work cannot be looked for from the present number of people. It is expected that by the beginning of January, when the fever has abated, the numbers will increase; but then a considerable number must be taken from the canal for the anicut and other head works which will require fully 1,500 men, of whom only about 400 are now present. Every effort will of course be made to procure more labour, but it must be remembered that the great works now commenced at Cuttack will drain nearly the whole available surplus of the coast districts; while at Hyderabad, one other chief source of supply, both the railway and the Bellary irrigation works, are coming more and more into competition with us.

I do not think that any important advantage would be gained by increasing the rates for earth-work. It is quite evident that these are already so high that they even to some extent encourage idleness. I am assured by the executive officers that export labourers can earn with ease sums which enable them to idle some part of their time. Heavy bounties might perhaps attract large contractors. This is the only way in which I can see any prospect of any very important increase in the present rate of progress. But this will involve increased estimates. I would not, however, say positively as yet that more rapid progress can only be obtained at the cost of increased expenditure, but I certainly think our present prospects unpromising, and has led me to consider whether any modification of the project for this barrier could be devised which would afford within a shorter time a part at least of the advantages sought for in the original scheme.

35. In directing my attention to this question, it has occurred to me that one essential point to be borne in mind is, that if four months' navigation can be obtained at this barrier, we shall have gained all that for a few years to come can be required, inasmuch as the upper rivers at least will only be navigable for that period. It is true that navigation below this point is practicable for a longer time, and a little attention bestowed upon the improvement of the bed will increase that time; but this is of importance only to the local traffic between this barrier and the coast, or to such as may converge to this point by land from either side of the river. This can be provided for, as the river is open to Dowlaishwaram; but for the trade of the upper country, a four months' navigation will suffice until the river above has been further improved.

36. Now, it is surely a mistake to be spending money on works that will give a twelve-month's navigation at this barrier, when the river alone is practically available only for four, and when the money might be spent to much greater advantage in completing and extending a four months' navigation to greater length of river. If four lakhs, for instance, will render this barrier passable for four months, then the other 11 might, with far greater advantage, be expended in opening the third barrier for the same time, than in opening the first for 12 months. This would be the case, even were there an ample supply of money. The mistake is still worse when the funds available are so limited as with us, because to expend the extra amount on the first barrier is to protract so much longer the opening of the third. Every year and every lakh expended on works required for anything beyond a four months' navigation here is so much time and money misused, diverted from works which would yield an immediate return, and spent upon others which afford no corresponding advantages. The proper course under any circumstances, and especially in our difficulty about funds, is to open the whole river for four months, and then to extend this period by degrees throughout its whole course.

37. To carry out this principle at the second barrier would require that we should substitute small locks for large. That is the only way in which the expenditure of time and money could be reduced; but I do not think the gain would be so considerable as to make this worth while.

At the first barrier, no change need be made in any of the works already planned and estimated for, but the *addition* of one work only is required. The river from the proposed site, for the tail locks up to within two miles of the head of the canal, requires only a very trifling amount of blasting of rock in the bed to render it perfectly navigable for four months. I have personally examined it, and though no detailed estimate has yet been prepared, I think that 10,000 rupees or 15,000 rupees would be quite sufficient for the purpose. Supposing this done, all that would then be required would be the construction of a double lock, with a lift of 25 feet, communicating between the canal and the river.

This could be placed at a point about two miles below Dumagudiem, and when the canal connecting it with the Sunka channel had been completed, the communication would be perfect. I would propose to make both lock and canal practicable for boats only. This would be sufficient for the requirements of the next few years, until the canal and large locks at its lower terminus are completed.

38. It may be objected that the construction of a lock intended for use only until the canal is finished will involve an unnecessary expense, but I would point out that this lock will always be valuable. In fact, I look upon it as a necessary adjunct to the canal, which must sooner or later be supplied. For it will be readily understood that a canal running along the river's bank, and protected by embankments from the floods, will always

be liable to the occasional irruption of a flood. Accidents of the kind do happen, and in the Delta have frequently happened. They are not there of much consequence, but here might lead to a temporary interruption of the communication. This is a contingency which obviously should be provided against, and a lock situated near the head of the canal which would afford communication between it and the navigable part of the river during the monsoon months, would exactly meet the difficulty. The navigation would then proceed uninterruptedly, even though the temporary closing of the lower part of the canal had been rendered necessary in order to effect repairs. The advantages of such a work seem to me obvious and indisputable, and in a very short time I have no doubt its construction would be regarded as absolutely necessary, even though the canal had been completed according to the present design. There can be no question, therefore, in my opinion, of the permanent value of the works, while its immediate use would be most important.

39. I beg to draw especial attention to this proposition. It seems to me a most important one, offering at once an easy solution of all the difficulties connected with the prosecution of the works now in progress at this barrier; difficulties which threaten not only to protract the time of execution much beyond what was originally hoped for, but are obstacles in the way of extending similar improvement to other parts of the river. The completion of the anicut even is not necessary for a four months' navigation. All that is now required is the construction of the sluice wall across the lower end of the Sunka channel, that of the proposed lock, and the excavation of two miles of canal.

All this might be so far completed by next freshes as to open the communication there. This barrier would then be passable as long as the rivers above are navigable, and while the works in the open parts of the bed intended for increasing the time of navigation, such as clearing rocks and construction of groins, are in progress, those for the completion of the canal at this barrier can be carried forward also, and the expenditure can be so arranged that the completion of both will be simultaneous.

40. This seems to me to be beyond all question the natural and proper mode of procedure. Two or three lakhs would then suffice for all the immediate requirements of this barrier, and the expenditure of the remaining 13 lakhs might be distributed over a period of five or six years. This would set free for expenditure on the second and third barriers, a considerable portion of the funds, which would otherwise have been appropriated to the first barrier, and that without in the least degree obstructing the navigation of the river, or interfering with the works now in progress, which would be completed as soon as they would be really required. The diminished expenditure at the first barrier would be accompanied by a considerable reduction of the establishment, and the pressure upon our resources and consequent increase of expense which the difficulty of procuring labour, and the inability of the present steamers to meet the demands made upon them now involve, being removed, the works might be carried forward to completion with less difficulty, and certainly at less cost. It would no longer be necessary to pay heavy bounties to attract large bodies of labourers, nor to carry on work during the rainy and unhealthy seasons when so little return is received for the expenditure. The supply department might probably be dispensed with altogether, as the neighbouring country would furnish the food required, and petty contractors could undertake the supply of it.

41. My views, then, in regard to the further prosecution of the Godavery project generally may be thus summarised :--

1st.—That the extension of the navigation to Hingunghat is an essential and integral part of the project, and that to abandon it will be to deprive a large and most important part of the valley of the benefit of the communication with the coast, and to sacrifice the most promising source of adequate and speedy returns.

2nd.—That the works required for the third barrier and the Wurdah present no practical engineering difficulties whatever.

3rd.—That the Wurdah being well adapted for the reservoir system of improvement, the practicability of applying that system should be fully investigated.

4th.—That the river below the third barrier being navigable in its natural state for four or five months only, the works proposed for the two lower barriers should, in the first instance, be limited to what is required for a navigation of that duration.

5th.—That the navigation from Hingunghat to the sea having first been rendered practicable for four or five months, the works required for its gradual extension to a longer period of the year should proceed *pari passu* at all points along the river.

42. The course of procedure which I would now recommend, in order to give practical effect to these views, is as follows :—

1st.—I propose that all the available resources at the first barrier shall be concentrated on the work of opening a four months' navigation immediately in the manner above described, viz., on the construction of an additional lock two miles below the head, and of the sluice wall at the head, and the excavation of the portion of canal required to complete the communication; also that such blasting of rock as may be found necessary in the river bed between the barrier and Badrachellum be also undertaken.

2nd.—That the works at the second barrier should be carried out on the plan recently submitted as speedily as the funds available may permit.

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3rd.—That

3rd.—That a competent officer of the Department of Public Works should be immediately appointed to the work of preparing the necessary plans and estimates for a boat canal, at the third barrier. It should be observed that the proposed anicut at the head of this barrier will throw the water back on a dead level nearly to Chanda, so that the completion of the third barrier works will open the navigation for the whole year to that point.

4th.—That as soon as the estimates for this work have been sanctioned, it should be put in hand, and that the greater part of the funds which, according to the original intention, would have been devoted to the completion of the canal works at the first barrier, should be applied to the vigorous prosecution of those at the third.

5th.—That simultaneously with these works the construction of a reservoir on one of the affluents of the Wurdah should be undertaken, a site having been selected, and the estimates passed according to rule.

6th.—That no further works beyond the removal of a few rocks should be undertaken in Wurdah, until the effect of the reservoir on its navigation had been ascertained.

7th.—That the clearance of rocks, protection of banks, and construction of groins along the whole of the river below the third barrier, be estimated for at once on a plan which I shall submit in a subsequent letter, and that such of these works as there may be funds for, be put in hand.

8th.—That the remaining works of the canal at the first barrier should not be stopped, but proceeded with at a less rapid pace, with such funds only as a due regard to the interests of the works required at other points may permit.

43. With regard to the engineering staff required for these works, you are aware that additional executive engineers are required at the first and second barriers. It is questionable, indeed, whether the works at the first, if carried forward on the plan now proposed, might not be entrusted to one of the assistant engineers already employed. The part of the project for which a competent officer should be selected with the greatest care is the third barrier works and the reservoir for the Wurdah. This will require an officer of special qualifications, and if I should be so fortunate as to obtain the assistance of Mr. Hanna in the prosecution of the Godavery scheme, there is no part of it where he could render more valuable aid, as there is none, in my opinion, of greater interest than the projecting of the works required for the part of the river referred to.

Judging from his report on the Nagpoor reservoir, I know of no officer to whom the very important part of the project might be entrusted with so much confidence.

44. If the plan of procedure should be approved and decided upon, the expenditure required to open a four or five months' navigation from Hingunghat to the coast would be—

									Lakhs.
First barrier works	-	-	-	-	-	-	-	-	3
Second „ „	-	-	-	-	-	-	-	-	10
Third „ „	-	-	-	-	-	-	-	-	13
Reservoir	-	-	-	-	-	-	-	-	2
Clearance of rocks	-	-	-	-	-	-	-	-	1
Total - - - Lakhs									29½

Now, if 10 lakhs a year could be given for three years, the river might be opened to this extent in that time, and if another two lakhs per annum could be made available, the works at the first barrier required for the completion of the original project might be carried forward also.

I cannot conceive that there can be any question as to the superiority of this plan to that of completing the two lower barriers first, and would strongly recommend its adoption.

It will, indeed, I think, quite fall in with the Chief Commissioner's own views in regard to the Godavery, if only I have succeeded in showing the practicability of rendering the Wurdah navigable.

P.S.—I would request early orders upon this letter, as some buildings, which it is now in contemplation to erect, if the works were carried on as at present, may not be necessary if the plan of procedure above recommended be adopted.

Enclosure 3, in No. 1.

(No. 422C—2977, dated 2nd July 1864.)

From Colonel *R. Strachey*, R.E., Secretary to Government of India, Public Works Department, to Chief Commissioner, Central Provinces.

YOUR Secretary's letter No. 1239, of 17th December last (received on 29th April), in continuation of former correspondence,* and submitting copy of a report by Captain Haig, on the general system to be followed in the prosecution of the works for improving the navigation of the Godavery, having been laid before the Government of India, I am directed to communicate the following observations and orders:—

*Central Provinces, No. 85, dated 24th January 1863. Public Works Department, No. 1388, dated 14th July 1863.

2. Captain Haig commences his letter by discussing the question whether operations at the third barrier should be suspended till the works at the 1st and 2nd barriers shall have been opened, and he argues strongly that the whole of the operations should go on simultaneously along the entire course of the river to Hingunghat.

3. He then, paragraphs 4 to 14, adverts to the great value of water communication along the Godavery, and in paragraphs 15 to 19 discusses the character of the river bed, with the object of showing that, so far as the levels or character of the channel are concerned, there are no physical difficulties that cannot be overcome.

4. Paragraphs 19 to 22 relate to the probable cost of the works. This is stated as follows:—

	<i>Lakhs.</i>
1st barrier, including past expenditure - - -	21
2nd „ - - - - -	10½
Clearance of rocks to 3rd barrier - - - - -	6
3rd barrier - - - - -	13½
Wurdah above 3rd barrier - - - - -	9½
Total - - - <i>Lakhs</i>	60½

5. Paragraphs 23 to 33 discuss the means of adding to the supply of water by means of reservoirs, and suggest that it may be better to improve the navigation of the upper part of the Wurda in this way than by the construction of dams.

6. Paragraphs 34 to 40 suggest that an arrangement should be made at the 1st barrier by the construction of a set of locks near the anicut by which the navigation can be opened during the rains for an outlay of two or three lakhs, leaving the prosecution of the permanent navigation channel to be gradually carried out, and applying what money can be given for the works generally, to the earlier commencement of operations all along the upper part of the river.

7. Paragraphs 41 to 42 give a summary of Captain Haig's conclusions.

8. Paragraph 43 states that an additional engineer of some experience is required to take up the investigations connected with the works in the upper part of the river.

9. Paragraph 44 gives an opinion that 30 lakhs, at the rate of 10 lakhs for the next three years, should suffice to carry out all the works that Captain Haig regards as necessary to open out the *whole* river for a four or five months' navigation.

10. You express your concurrence in Captain Haig's views of the great advantages to be derived from opening up the river throughout, but, in the absence of reliable plans, you decline to recommend the adoption of Captain Haig's proposals for doing this.

11. In regard to the practicability of rendering the Wurda navigable, you maintain your former conclusion, that more precise information on the engineering detail and probable cost is required before offering an opinion.

12. As to Captain Haig's general estimate of the probable cost of the works required for the third barrier, you are not disposed to place much reliance upon its accuracy, believing such general calculations to be usually fallacious, especially in a primitive country like this, where the condition of things is in transition; and, in the absence of plans and estimates in detail, you consider it premature to speculate upon the cost of the works.

13. On the question of increasing the water supply in the Wurda, you express doubts whether suitable sites are likely to be found for the reservoirs proposed, and whether the natural drainage would fill such reservoirs. An examination of the valley mentioned by Captain Haig, however, you consider desirable.

14. On the proposal to construct, in the first place at the first barrier, a set of locks by which the navigation may be maintained for four months in the year, you express your concurrence, provided these lesser works can be made to fit in with the larger ones; but here again detailed plans and estimates are required to determine on the propriety of the

proposal. But you repeat your opinion, that no works should be begun at the third barrier until the practicability of making the river above it navigable has been established.

15. On all these points I am to say that the Governor General in Council entirely acquiesces in your views, which are essentially those before advocated by you, and approved by the Government of India.

16. The only point referred to in the correspondence that remains for special comment is that of the additional engineering establishment applied for by Captain Haig. It is admitted that at present the number of superior officers attached to the Godavery works is small as compared with the extent of the charge. His Excellency in Council is willing, therefore, to add another executive engineer; but as one of experience cannot at present be spared from the department under the Government of India, the Government of Madras has been requested to nominate an officer who, by constitution, training, and personal position, is qualified for the duties that will be required of him.

17. I am directed to add, however, that the necessity for attention to the formation of the works into proper executive charges was specially pointed out in Public Works Department Resolution, No. 5089, dated 29th December 1862, para. 13, and that no notice has yet been taken of this. If, therefore, Captain Haig has not been supplied with a proper staff of officers, the blame does not rest with the Government of India.

*See Public Works
Department Reso-
lution Nos. 970-72,
dated 6th June,
para. 11.*

18. His Excellency in Council is still of opinion that there is room for considerable economy in the subordinate establishments employed in the Godavery works. Your attention was pointedly drawn to this subject in June 1863, and in the recent orders on the current year's budget; and I am again to request that the matter may receive early and careful attention; so that, while the addition of an executive engineer is made to the superior establishments, the increased charge may, if possible, be met by economy in the subordinate grades.

19. The Governor General in Council observes that your remarks which have been referred to above plainly show that you quite perceive the necessity for these great works being carried out on definite plans and estimates properly sanctioned, and that no satisfactory conclusions can be come to on many important points till the designs for the projected works are in a much more forward state than they now are. This view has been broadly stated by the Government of India on every occasion on which the subject of these works has been under discussion during the last few years. Yet it is necessary that his Excellency in Council should once more remark that, though actual operations on the Godavery have been in progress many years, and definite designs and estimates have been repeatedly called for, the absence of all specific information now is as complete as ever. It should not have been the case that these documents have been so long delayed, nor should the Government of India have been so long left thus very imperfectly informed of the exact nature of the works to be taken in hand, or the sum of money that will probably be required to carry them out.

20. The non-submission of the estimates for the first barrier it is known was caused by accident in the first instance, but the papers have long since been reported to have been found, and his Excellency in Council thinks they should have reached him ere this. In regard to the second barrier, the Government of India is still in absolute ignorance of what is proposed to be done. Again, no report has yet been received regarding the transport service which consumes a large proportion of the sums granted for the prosecution of the works, though called for so far back as July 1863, and the Government of India has still much reason to doubt the efficiency and economy of the present arrangements.

21. The Government of India has had such repeated experience of the extreme objections that exist to permitting works to be begun without sanctioned designs and estimates, and the larger the works the greater obviously will be the objections, that it is with the greatest reluctance that it sees the prolonged prosecution of these operations on their present footing. It would be a matter for regret if further continued delay in submitting the needful papers forced on the Governor General in Council the necessity for putting a stop to active operations on the works till the required series of projects and estimates are framed and sanctioned, but it is necessary to caution you that, unless these are submitted at an early date, the Government of India may be compelled to adopt this course.

22. The Governor General in Council has every confidence in Captain Haig's great ability and in the real interest he takes in these works; but his Excellency in Council feels it necessary to remark that his line of action has not yet been taken in the direction that is essential for satisfactory progress, as distinctly and strongly as seems requisite. His aim should be to produce, in the first instance, and in the shortest time possible, a perfectly definite scheme on which the Government of India should be able to pronounce a final judgment, and to see with approximate truth the entire expenditure that will be involved in carrying out the works to completion. Till this is done, the Government cannot feel any just confidence that the projected works are either suitable or practicable, and doubt will of necessity mark every step taken in connection with them.

23. The Secretary of State and the Government of India have, it is believed, done everything in a reasonable way to aid the progress of these works, and their disposition to do this remains unchanged. But the initiative in future progress must be taken by the officers

officers on the spot. His Excellency in Council trusts therefore that Captain Haig will perceive that in making these remarks there is no want of appreciation of his services; and that he will recognise the necessity of complying with this most reasonable requirement, and will lose no further time in submitting such complete projects and estimates as will allow of the Government of India permitting these works to be carried on without check and with all the vigour possible with the means that may be available. Should it appear to you, after reference to Captain Haig, that further assistance is absolutely required by him, you should make a further reference to Government on the subject.

24. I am to take this opportunity to forward, for your information, copy of a recent Despatch from the Secretary of State on the subject of these works, and to point out that the Government of India is unable to give any reply to the inquiries made, as it is without the necessary information as to the progress of the works. It is obviously an important part of the duties of the executive officers on the works to keep the Government informed of their progress, and the Governor General in Council desires that you will be good enough henceforward to submit a half-yearly report, giving the needful explanations illustrated by suitable sketches or plans.

No. 18, dated
25th April 1864.

P.S.—Since writing the above, some of the papers alluded to in paragraph 20 have been received in this office.

— No. 2. —

(Public Works Department.—No. 59 of 1864.)

To the Right Honourable Sir *Charles Wood*, Bart., G.C.B., Secretary of State for India.

Sir,

Simla, 4 August 1864.

In continuation of our Despatch, No. 48, dated 2nd July 1864, regarding the Godavery River Improvement Works, we have the honour to state that designs and estimates prepared under the direction of Captain Haig for the works proposed at both the first and second barriers have lately been submitted to us, but the information on some parts of the questions involved in the projects has unfortunately been sent up in so incomplete a manner as to prevent our dealing with them. What is required has been called for, and we hope to be able to report before long what are the conclusions we have come to on these projects.

2. We beg to enclose herewith copies of drawings and a letter from the Chief Commissioner, Central Provinces, which we have just received, illustrating the present state of progress on the works at the first barrier. These sketches constitute the first report the Government of India has ever received of the state of these works, and being unaccompanied by any explanation you will perceive how incomplete it is.

3. From a letter subsequently received from the Chief Commissioner, Central Provinces (copy of which is also enclosed), it will be seen that the expenditure during the past year is stated to have been,—

							<i>Rs.</i>
First barrier	-	-	-	-	-	-	4,13,591
Materials	-	-	-	-	-	-	1,61,498
TOTAL - - - <i>Rs.</i>							5,75,089

The whole sum assigned was seven lakhs for *works*, besides about $1\frac{1}{2}$ lakhs for establishment, so that $1\frac{1}{4}$ lakhs of the sum granted for the works has not been utilised. This doubtless was owing to the difficulties which exist in obtaining labour.

We have, &c.
(signed) *John Lawrence.*
H. Rose.
R. Napier.
H. S. Maine.
C. E. Trevelyan.
W. Grey.
G. N. Taylor.

Enclosure 1, in No. 2.

(Public Works Department.— No. 1075—37.)

From Secretary to Chief Commissioner, Central Provinces, Public Works Department, to
Secretary to Government of India, Public Works Department.

Office of Secretary to Chief Commissioner, Central Provinces,
Nagpore, 7 July 1864.

Sir,

I AM directed by the Chief Commissioner to transmit, for the information of the Government of India, three tracings showing the progress on the works in the first barrier of the Godavery up to 30th June last.

2. It is to be inferred from the above,—

First. That the anicut at Doomagoodium is half finished.

Second. That the excavation of the canal is one-third done.

Third. That the scouring sluices are only begun.

Fourth. That more vigorous efforts must be made next season.

I have, &c.

(signed) *C. H. Dickens*, Lieutenant Colonel,
Secretary to Chief Commissioner, Central Provinces,
Public Works Department.

Enclosure 2, in No. 2.

(Public Works Department.—No. 1534/211.)

From Lieutenant Colonel *C. H. Dickens*, R.A., Secretary to Chief Commissioner,
Department Public Works, Central Provinces, to Colonel *R. Strachey*, R.E., Secretary
to the Government of India, Department Public Works, Simla.

Office of Secretary to Chief Commissioner, Department Public
Works, Central Provinces, Nagpoor, 28 July 1864.

Sir,

IN continuation of my No. 1075/37 of the 7th instant, I am now directed to submit the following abstract of the progress of the Godavery works during the past year, which will afford better information with reference to the desire expressed in the concluding paragraph of your letter, No. 422 C/2977 of the 2nd instant.

2. The expenditure during the year on the first barrier was 413,591 rupees. The masonry work done was confined to the anicut and scouring sluices at the head of the canal. In these 368,737 cubic feet of rubble and 4,371 cubic feet of dressed stone masonry were built. In the canal 98,23,044 cubic feet of earthwork were executed. The actual progress towards completion in quantities of work done may be stated in each case at 13 per cent. of the work remaining to complete on 1st May 1863. This progress has not come up to Captain Haig's expectations, but it appears from the Controller's Office that there was, besides the work recorded, an expenditure of 1,61,498 rupees on materials, and also a good deal done in buildings, repairs, and other subsidiary work.

3. At the second barrier only preparatory work connected with the preparation of estimates was done.

I have, &c.

(signed) *C. H. Dickens*, Lieut.-Colonel, R.A.,
Secretary to Chief Commissioner, Department Public
Works, Central Provinces.

— No. 3. —

PUBLIC WORKS DESPATCH from the Secretary of State to the Government
of India, No. 62, dated 17th November 1864.

Para. 1. I HAVE had under consideration in Council your Excellency's Despatches, Nos. 48 and 59, of 2nd July and 4th August last, on the subject of the Godavery Navigation Works. Among the papers which accompanied these Despatches are two letters from the Chief Commissioner of the Central Provinces, and three illustrative drawings, together constituting, as you say, the only report which has ever been rendered to your Government of the state of the

the

the works. The report is not very explanatory, but could scarcely be less satisfactory as far as it goes.

2. It appears that during the year 1863-64 a sum of 4,13,591 rupees was expended at the first barrier, yet that the progress made there was only 13 per cent. of the work remaining for execution at the beginning of the year. At this rate the work at the first barrier alone will cost more than the amount originally stated by Captain Haig as the probable expense of opening 473 miles of navigation from Dowlaishweram upwards, and more than the amount which so lately as the 23rd January 1863 was mentioned by Mr. Temple as likely to suffice for rendering the river navigable to the foot of the third barrier. With such decisive proofs before you of the worthlessness of all past calculations, it would be highly improper to allow operations based upon them to be continued with the same absence of check or control as heretofore.

3. You have intimated to the Chief Commissioner of the Central Provinces, that unless the detailed plans and estimates so repeatedly called for are speedily submitted in a complete form, you may be under the necessity of stopping the works; and there can be no doubt that it will be incumbent upon you to do so rather than run any further risk of committing yourselves to an indefinite expenditure on account of them.

(signed) C. Wood.

— No. 4. —

Public Works.—No. 10 of 1865.

To the Right Honourable Sir *Charles Wood*, G.C.B., Secretary of State for India.

Public Works Department, Fort William,
26 January 1865.

Sir,

WITH reference to the concluding paragraph of our Despatch, No. 48, dated 2nd July last, we have the honour to forward a progress report of the Godavery Navigation Works for the half-year ending 31st October 1864. Civil Works.—
Communications.

2. We hope that future reports will exhibit the actual state of the works in a more complete manner, instructions having been issued with this object.

3. We may add that Captain Haig, who is now in England, will doubtless be able to afford you any information you may desire in regard to the present state of these works.

We have, &c.
(signed) *John Lawrence.*
H. Rose.
R. Napier.
H. B. Harington.
H. S. Maine.
C. E. Trevelyan.
W. Grey.

Enclosure, 1 in No. 4.

(No. 5605—1853, dated 3rd January 1865.)

From *A. G. Crommelin*, Esq., Assistant Secretary to Chief Commissioner, Central Provinces, in the Public Works Department, to Secretary to Government of India, Public Works Department.

IN compliance with the instructions of the Government of India, conveyed in your letter, No. 725 C—4128, dated 30th August last, I am directed to transmit herewith, in original, for the information of Government, the half-yearly Progress Reports of the 1st and 2nd Barrier Divisions of the Upper Godavery Circle, accompanied by Statements (A.), (B.), and (C.), and sections, for the half-year from 1st May to 31st October 1864.

Enclosure 2, in No. 4.

(No. 871, dated 7th December 1864.)

Progress Report for the Half-year from the 1st May to 31st October 1864, by
Major *J. Stoddard*, Officiating Superintending Engineer, Upper Godavery Circle.

THE Government of India having directed that a half-yearly report of progress on the Godavery Navigation Works should be submitted, the executive engineers in charge of the 1st and 2nd barrier divisions, in which alone any work has as yet been begun, were called upon on the 4th November last to furnish the necessary drawings and statements at the earliest possible date. These sketches and statements reached me only yesterday, and I now lose no time in forwarding them with a few remarks.

2. It is necessary first to observe that the half-year for which the returns are compiled is that which comprises the whole of the monsoon and flood months; it is therefore not to be expected that the quantity of work, especially that in the bed of the river, such as the anicut and scouring sluices, will be much.

3. As the establishments, however, were kept up to the full strength during the above period, the per-centage of superintendence on the value of work done must of course be high. In the first division it amounts to 25 per cent., inclusive of the salaries of the whole engineer establishment.

4. Nearly the whole expenditure incurred during the half-year was in the first barrier division, and the works on which progress was chiefly made, are—

1st.—The anicut, on which work to the value of 15,895 rupees was done. The particulars of work are given in the accompanying Statement (A). It appears from it that 35,632 cubic feet of masonry were built in the anicut.

2nd.—Scouring sluices across Lunka Channel, in which 21,939 cubic feet of masonry were built. The expenditure on this work is 12,038 rupees.

N. B.—It appears from Captain Haig's progress report, dated 14th July last, that 3,73,108 cubic feet of masonry had been built on the anicut and scouring sluices up to 30 April 1864. Consequently up to 31st October last, the quantity of masonry is 430,679 cubic feet.

3rd.—The canal and flood embankment, on which the expenditure was 23,551 rupees, and the work performed 4,231,751 cubic feet.

4th.—Workshops and other buildings for the accommodation of establishments and workpeople: total expenditure on these was 29,647 rupees. The workshops have been very nearly completed, the roofing being all of corrugated iron-plate. This material has also been largely used in covering the cooly sheds. It is expensive at first, but by far the cheapest in the long run, as it is indestructible nearly, and can be removed from place to place when required; whereas grass roofs, which hitherto were in general use, were very insecure, and were frequently burnt down.

5th.—Limestone, and cutstone, and rubble-stone quarries. The expenditure on these was 12,529 rupees.

6th.—Lime and cement works. Total expenditure in the half-year, 13,923 rupees. The remaining items need not be here specially mentioned, as they are all shown in the Statement (A.), with the sums expended on each opposite to them.

* Four in number.

5. The tracings which accompany this report* will show more distinctly to the eye the quantity of work done already on the three principal works, viz., the anicut, scouring sluices, and canal and river embankment, than any written description.

6. As regards the future prospects of these works on the first barrier, I think I may say that they are more cheering than last year. Great exertions have been made, and are still being made to procure labour, and by means of liberal bounties to recruiting agents, and somewhat higher rates to the workpeople themselves, the number has now reached to nearly 5,000, and it is believed that in a couple of months more the number will be just double that, if not more.

7. Every effort will be made to open out a four months' navigation, as recommended by Captain Haig in his letter dated 3rd September, No. 459, written just before he left the circle for Europe; but the delay in receiving the orders of Government as to the size of the lock chambers is rather embarrassing.

The excavations for the head lock here, and for the guard lock at Seetumpett, and the upper single tail lock at Sodaram, are being dug for locks 200' × 27' in the chamber, according to drawings left by Captain Haig with the executive engineer, Mr. Isaac.

I observe, however, that in his letter, No. 333, dated 31st August 1863, which accompanied the first plans and estimates laid before Government, Captain Haig says that the lock chambers are to be 175' × 25' only. It is therefore desirable that the decision of Government, as to the size to be given to the locks, be communicated as early as possible.

8. As regards the funds provided in the current year for these works, I firmly believe that they are not by any means more than will be spent; on the contrary, I am of opinion that even more could be profitably expended, if supplied.

By

By yesterday's post I received a communication stating that the Chief Commissioner has sanctioned a transfer of 80,000 rupees from establishments to the first barrier works; a very welcome addition. I have no doubt it will be fully expended.

9. At the second barrier the work performed during the half year under review was unimportant.

The estimates not having been sanctioned yet by Government, no expenditure was incurred on the navigation works proper. 10,000 rupees only were granted for erecting accommodation for establishments, clearing jungle, and making a few other improvements in the station of Enchampilly.

10. As this report is required to embrace only the Godavery works, I will not mention what has been done at Sironcha in the 2nd division, where there has been an expenditure of 20,328 rupees on the military and civil buildings.

These will be more properly noticed in the Annual Progress Report for the current year.

11. Statement B. accompanying will show the works and expenditure at the second barrier.

The amount therein stated for superintendence does not of course include the salaries of the engineer and upper subordinate establishments, but only the petty work establishments.

12. It is much to be regretted that the navigation works at this barrier have not yet been sanctioned, as valuable time for work is being rapidly lost, and the opening out of the river route unfortunately delayed. If sanction had been communicated ere this, much progress in the collection of materials would have been made, and probably a fair beginning of work in the bed of the river started.

13. It now only remains to notice the operations of the Supply and Transport Department. A statement, marked C., is appended, which shows at a glance what duties this department has performed during the past half year.

Purchases, chiefly of food and other necessities, to the value of 51,172 rupees, were made, and the value of similar articles retailed was 74,034 rupees. The cost of labour and establishments was in the former case a little over 10 per cent., and in the latter over six per cent.

14. The total money value of food purchased and retailed is just 1 $\frac{1}{4}$ lakh of rupees during the half year. The average cost of labour and superintendence is, as nearly as possible, eight per cent. This per-centage does not include the salaries of the superintendent and the permanent and office establishments, which properly are chargeable on the operations of both the Supply and Transport Departments together, and so is given at the end of the Statement C., being 8 $\frac{3}{4}$ per cent. on the whole operations of the double department.

15. The work done in the transport branch is also tabulated in the statement, and needs no further remark here.

16. The cold season, which is usually the feverish one, is now half over, and I believe that the sickness in the camp is below the average as yet, and the fever cases are not very bad.

The severity of the cold has, however, frequently been mitigated by a cloudy atmosphere and unusual rains, which perhaps is fortunate, as the natives always suffer most from cold.

17. I regret that this report is not more interesting, but in the present state of the works, it is hardly possible for even one well acquainted with the subject, as Captain Haig was, to make it so, and I trust my short acquaintance of only two months with them will be received as a sufficient excuse for all its defects.

(A.)

STATEMENT showing the Quantities and Cost of Works executed in the First Barrier Division, Upper Godavery Circle, during the Six Months from May to October 1864.

QUANTITY.	NAME OF WORKS.	AMOUNT.
	Anicut across River Godavery.	<i>Rupees.</i>
11,362	Cubic feet rock excavation for foundation - - - - -	15,895
31,954	" " rubble masonry laid - - - - -	
1,452	" " cut stone laid on Anicut Sluices - - - - -	
2,226	" " rubble masonry laid on Anicut Sluice - - - - -	
2,896	Superficial feet dressing cut stone ready for setting - - - - -	
7,384	Cubic feet grouting for apron - - - - -	
360	" " heaving in heavy stone behind the Anicut - - - - -	
	Scouring Sluices across Lankah Channel.	
1,14,131	Cubic feet earth excavation for foundation - - - - -	12,038
21,492	" " rubble masonry laid - - - - -	
447	" " cut stone laid - - - - -	
32,197	" " earth filled around end wall of Lankah Sluices - - - - -	
11,171	Superficial feet dressing cut stone ready for setting - - - - -	
	Lime and Cement Works.	
20,493	Cubic feet lime burnt - - - - -	13,572
28,639	" " cement manufactured - - - - -	
	Cut Stone Quarry at Nursapoor.	
2,325	Cubic feet stone quarried and dressed - - - - -	7,456
13,164	" " loaded on waggons for transport - - - - -	
1,15,770	" " earth cleared away - - - - -	
28,736	" " drains through rock - - - - -	
6,402	" " stone quarried and roughed out - - - - -	
	Lime Stone Quarry at Boomalankah.	
27,318	Cubic feet lime stone quarried - - - - -	4,247
72,185	" " lime stone carried to lime kiln - - - - -	
	Powder magazine at Lankah - - - - -	1,116
	Head Lock at Dumagudiem.	
76,409	Cubic feet excavation for lock - - - - -	1,923
	Flood Embankment at Dumagudiem.	
90,210	Cubic feet embankment - - - - -	399
	Canal.	
41,41,541	Cubic feet earthwork in excavation - - - - -	23,152
	Accommodation for establishment - - - - -	13,554
	Station improvements - - - - -	5,812
	Tramway Bridge over Turubaka.	
	Six trestles erected - - - - -	306

(A.)—Statement showing the Quantities and Cost of Works, &c.—*continued*.

QUANTITY.	NAME OF WORKS.	AMOUNT.
	Seethampett Lock.	<i>Rupees.</i>
1,35,521	Cubic feet excavation for foundations - - - - -	1,251
	Quarry at Davarapilly.	
23,867	Cubic feet earth and rubble stone cleared from faces of quarry - -	826
6,92,905	Superficial feet clearing jungle - - - - -	
4,475	Cubic feet rubble stone quarried and stacked on bank of river - -	
486	" " rubble stone transported to Sudaram - - - - -	
	Lime Kilns, Sudaram.	
1,583	Cubic feet stone quarried and stacked at site of kiln - - - - -	351
756	" " kunker excavated, shifted and stacked - - - - -	
22,910	Raw bricks made - - - - -	
270	Cubic feet kunker carried to site of lime kilns - - - - -	
3	Small native lime kilns constructed - - - - -	
	Upper Tail Stock.	
88,888	Cubic feet excavation for foundation - - - - -	583
9,176	" " stone quarried and stacked - - - - -	
	Workshop expenditure connected with workshop and other buildings -	16,093
	Repairs, &c., of floating stock - - - - -	7,624
	Rolling stock - - - - -	5,152
	Repairs of tools - - - - -	1,210
	Manufacture of stock - - - - -	8,053
	Miscellaneous items - - - - -	2,642
		1,43,255
	Establishment, being about 25 per cent - - - - -	35,508

T. J. Isaac, C. E.,
Ex. Engr., 1st Division,
Upper Godavery Circle.

J. Stoddard, Major,
Asst. Supdt. Engr.,
Upper Godavery Circle.

(B.)

STATEMENT of EXPENDITURE on WORKS of all Sorts in the Station of *Enchampilly*, Second Barrier Division, Upper Godavery Circle, showing quantity of Work done, and per-centage of Superintendence, between 1st May and 31st October 1864.

Quantity or Number.	Description of Work, and Rates.	Amount.	Superintendence.		Total Cost.
			Per 100.	Amount.	
		<i>Rs. a. p.</i>		<i>Rs. a. p.</i>	<i>Rs. a. p.</i>
	Survey and levels for 2nd Barrier project - - - - -	261 15 4	- -	- -	261 15 4
	Station Improvement:				
49,181 $\frac{3}{4}$	Cubic feet of drains dug, at <i>Rs.</i> 5. 6. 3. per 1,000 - - - - -	265 - 7	- -	3 11 1	268 11 8
4,16,470 $\frac{1}{4}$	Cubic feet of drains to roads, at <i>Rs.</i> 5. 12 10. per 1,000 - - -	676 4 4	- -	- -	676 4 4
66,720	Cubic feet of metalling to roads, including carriage, &c. &c., at <i>Rs.</i> 15. 4. 4. per 1,000 - - -	1,018 12 - $\frac{1}{2}$	- -	40 1 4	1,058 13 4
24,42,032	Square feet of jungle cleared, including roots here and there, at 4 $\frac{1}{8}$ pice per 100 - - - - -	520 13 9	- -	29 14 8	550 12 8
6	Bridges and culverts to roads - - -	272 15 2 $\frac{1}{2}$	- -	6 2 6	279 1 8
	Government garden - - - - -	142 13 7	- -	- -	142 13 7
	Petty establishment for store and collecting charge, &c. &c. - - -	246 - 3	- -	- -	246 - -
	Extra establishment (baker, &c.), on account of station improvement.	74 12 9	- -	- -	74 12 -
	Total Expenditure on Station Improvement - - - - -	3,217 8 6	2 7 8	79 13 7	3,297 6
	Accommodation for Europeans:				
	Subordinates' double bungalow, No. 1	652 4 10	5 11 8	37 4 11	689 9
	Outhouses for ditto - - - - -	113 5 -	2 9 -	2 14 2	116 3
	Assistant engineer's bungalow, No. 2	1,412 14 2	8 15 11	127 1 11	1,540 -
	Outhouses for ditto - - - - -	226 13 5	4 11 -	10 9 7	237 7
	Assistant engineer's bungalow, No. 3	1,932 10 9	3 14 10	75 13 4	2,008 8
	Total Expenditure on Accommodation - - - - -	4,338 - 2	- -	253 11 11	4,591 12
	Powder magazine - - - - -	464 12 6	2 6 -	11 - 3	475 12
	Completion and repairs of original Enchampilly buildings - - -	1,101 7 8	14 10 3	161 3 2	1,262 10
	Materials manufactured - - - - -	1,301 11 6	2 12 3	36 - -	1,337 11
	Materials purchased - - - - -	1,052 10 -	- -	- -	1,052 10
	Carrying stores - - - - -	563 10 11	- -	- -	563 10
	GRAND TOTAL - - <i>Rs.</i>	12,301 12 7	- -	541 12 11	12,843 9

Enchampilly, }
1 December 1864. }

Robert Montgomerie, Lieut., R. E.,
First Class Assistant Engineer,
2nd Barrier Division.

D. McGregor,
Sub-Engineer, 2nd Sub-division
J. Stoddard, Major,
Assistant Superintending Engineer,
Upper Godavery Circle

(C.)

UPPER GODAVERY CIRCLE.

TRANSPORT AND SUPPLY DIVISION.

PROGRESS REPORT of WORKS done during the Half Year ending 31 October 1864.

NAMES OF WORKS.	QUANTITY.	PARTICULARS.	AMOUNT.	TOTAL.
		<i>Purchased.</i>	<i>Rs.</i>	<i>Rs.</i>
Supply -	4,857	Bags of rice - - -	Value of provisions, &c., bought.	51,172
	8,012	Maunds of salt - - -		
	1,324	Bags of gram - - -		
	1,644	Tons of firewood - - -		
	3,000	Bundles of fodder - - -		
	41	Bags of wheat - - -		
	523	" of paddy - - -		
	400	Baskets - - -		
	105	Maunds coffee, tea, and sugar		
	1,000	Lbs. hospital stores - - -		
	15,130	Maunds of condiments - - -		
	1,000	Number of cocoanuts - - -		
	3	Coils of rope - - -		
	6,225	Number of gunnies - - -		
	70	Maunds of ghee - - -		
	9	Hides - - -		
	8	Ponies - - -		
	30	Dozens empty bottles - - -		
	560	Maunds of tamarind - - -		
	3,130	Post labels - - -		
	450	Cases beer - - -		
	3,000	Number of earthen pots - - -		
		Labour and Establishment for Purchases -	5,569	
		<i>Retailed.</i>		
	143	Bags of chollum - - -	Value of provisions sold.	74,034
	1,014	" of salt - - -		
	11,679	" of rice - - -		
	730	" of paddy - - -		
	422	" of grams, various - - -		
	109	" of wheat - - -		
	839	Maunds of tamarind - - -		
	80	" of Europe articles - - -		
	110	Dozens beer bottles - - -		
	188	Maunds of condiments - - -		
	48	Tins of biscuits - - -		
	100	Number of combles - - -		
	1,000	" of bamboos - - -		
	40	Yards flannel - - -		
	3,894	Post labels - - -		
		Labour and Establishment for Retails -	4,645	
		<i>Up River.</i>		
Transport -	293	Telegraph stores - 173 miles - - -		
	100	" " - 42 " - - -		
	180	District stores - - -		
	960	Provisions - - -		
	20	Private baggage - - -		
		Carried forward - - -	<i>Rs.</i>	1,35,420

(C.)—UPPER GODAVERY CIRCLE—*continued.*

NAMES OF WORKS.	QUANTITY.	PARTICULARS.	AMOUNT.	TOTAL.
		Brought forward - - -	Rs. -	Rs. 1,35,420
	No.	<i>Up River—continued.</i>		
Transport -	390	Passengers - - - 120 miles - -		
	1,932	„ Coolies, &c. } 96 „ - -		
	Tons.			
	11	Private baggage - - -		
	857	Cut stone - - - 8 „ - -		
	7	Salt - - - 40 „ - -		
	22	„ - - - - - - - -		
	100	District stores - - - 82 miles - -		
	50	Private baggage - - - - - -		
	70	District stores - - - 67 miles - -		
	6	Private baggage - - - - - -		
	24	Passengers - - - - 26 miles - -		
Total Tons -	2,383	= 2,65,311 for 1 Mile.		
		<i>Down Rivers.</i>	24,367	
	3	District stores - - - - - -		
	2	Provisions - - - 158 miles - -		
	6	Private baggage - - - - - -		
	465	Passengers - - - - - - - -		
	40	Private baggage - 96 miles - -		
	40	Passengers - - - 120 „ - -		
	4	District stores - - 103 „ - -		
	150	Materials for works - - - -		
	16	Provisions - - - 40 miles - -		
	1,664	Limestone - - - 26 „ - -		
	380	„ - - - 14 „ - -		
	411	„ - - - 20 „ - -		
	20	Private baggage - - - - - -		
	54	Passengers - - - 82 miles - -		
Total Tons -	2,696	= 71,074 for 1 Mile.		
		Freight realised - - - -	333	
				24,700
		Total - - -		1,60,120
		Superintendence, at 8½ Rupees per Cent. - - -		14,025
		GRAND TOTAL - - Rs.		1,74,145

Dumagudeim,
Transport and Supply Office,
5 December 1864.

G. Begbie, Captain,
For Acting Superintendent of Transport
and Supply Division.

J. Stoddard, Major,
Assistant Superintending Engineer, Upper Godavery Circle.

— No. 5. —

(Public Works.—No. 12 of 1865.)

To the Right Honourable Sir *Charles Wood*, Bart., G.C.B., Secretary of State
for India.

Public Works Department, Fort William,
30 January 1865.

Sir,

Civil Works—
Agricultural.

WITH our Despatches No. 79, dated the 9th December 1863, and No. 48, dated the 2nd July 1864, we forwarded papers on the subject of the works on the Godavery River. Allusion was made in them, particularly in those which accompanied the latter Despatch, to the possibility of maintaining the navigation of this river beyond the third barrier up the Wurdah, for at least a portion of the year, by the construction of storage reservoirs.

2. In order to determine this point, the Chief Commissioner of the Central Provinces directed Mr. Hanna, who had in January 1863 been appointed Superintendent of Irrigation, in view to the investigation and restoration of old works of irrigation in those Provinces, to examine the valleys of the three large rivers, the Kanhan, Pench, and Wynegunga. Mr. Hanna has submitted reports, from which it appears that he thinks it feasible to construct reservoirs for storing the waters of all these rivers, but time has only allowed of the valleys of the two first-named rivers being examined and reported on in detail. Numerous sites for smaller reservoirs have also been met with favourably circumstanced for irrigation.

3. There is little doubt that works such as are spoken of might, if carefully designed and executed, prove successful and remunerative, but the conditions under which they would be constructed and used, particularly those of the larger class, involve local peculiarities, the complete apprehension of which can only be fully appreciated by trial; and we have informed the Chief Commissioner that it will be the best course, and one that is most likely to lead to final success if operations are commenced with caution, and gradually extended as the engineers gain experience and become fully acquainted with the exact requirements of the case. We have discouraged the idea of applying the waters kept up in such reservoirs to supplement the navigation of the Godavery, and have informed the Chief Commissioner that the first thing to be done is to attend to irrigation to the full extent of the requirements of the country.

4. For the reports submitted by Mr. Hanna, the Chief Commissioner's views and our orders on the subject, we beg to refer you to our proceedings noted at foot.

We have, &c.
(signed) *John Lawrence.*
H. Rose.
R. Napier.
H. B. Harington.
H. S. Maine.
C. E. Trevelyan.
W. Grey.

DOCUMENTS referred to.

Proceedings (Civil Works—Agricultural) November 1864, Nos. 10 to 14.

Proceedings (Civil Works—Agricultural) October 1864, Nos. 17 to 23.

See also Proceedings (Civil Works—Agricultural) February 1863, Nos. 7-8.

— No. 6. —

PUBLIC WORKS DESPATCH from the Secretary of State to the Government of India, No. 26, dated 29th April 1865.

Para 1. I HAVE had before me in Council your Excellency's Despatches Nos. 10 and 12, of 26th and 30th January last, the one transmitting a Progress Report of the Godavery Navigation Works for the half-year ending 31st October 1864, and the other relating to the possibility of rendering the river navigable above the third barrier, by the construction of storage reservoirs.

2. The report treats merely of very recent observations, and little can be gathered from it as to the actual state of the works. It is to be hoped that the next report will be drawn up in strict conformity with your directions, and will show clearly what progress since the commencement of the works has been made up to date.

3. I observe with approval that you do not encourage the storing, on a large scale, of water for the purpose of rendering the navigation of the river available for an extended period of the year. The formation of large reservoirs at a distance from the river must, under any circumstances, be attended with great cost, and not very certain results; and it must always be borne in mind that one principal recommendation of the Godavery Improvement Project, as originally submitted, and on the faith of which it was entertained and sanctioned, was that it could be executed at a very moderate expense; but the addition of storage reservoirs, and the magnitude of those apparently contemplated, must necessarily raise the original estimate to an amount far beyond what it would be advisable to pay for the object of rendering the Godavery navigable during the whole or greater portion of the year.

4. The construction of reservoirs for irrigation in appropriate positions may reasonably be expected to be beneficial and remunerative, if carried on in the cautious and experimental manner you recommend, viz., that a few works should be undertaken in the first instance on a moderate scale, to be extended afterwards as may be advisable. The expenditure on such works will of course be kept quite separate from that for the improvement of the navigation of the Godavery.

(signed) C. Wood.

— No. 7 —

(Public Works.—No. 90 of 1865.)

To the Right Honourable Sir *Charles Wood*, Bart., G.C.B., Secretary of State for India.

Public Works Department, Simla,
9 August 1865.

Sir,

WE have the honour to forward a copy of the Progress Report of the Godavery Works for the half-year ending the 30th April 1865.

2. The report shows the difficulties which the engineers have to contend with on the works, which were enhanced this season by the lamentable outbreak of cholera. But the result is not, to our minds, by any means so discouraging as the letter from the Secretary to the Chief Commissioner, forwarding the report to us, would make it appear.

3. The work at the first barrier consists of the anicut and 25 miles of canal with locks. Of the anicut two-fifths of the work is done, and the same proportion nearly

nearly of all the masonry works. Of the earth-work, only one-fourth has been done. But as, on the suggestion of Captain Haig, a modification of the project is in contemplation, by which the lower part of the canal will not be required for the present, and the work will be restricted next season to the upper four miles, this result of the two years' work does not indicate that it will take six years more to complete the whole of the works at the first barrier. We hope that this may be done in three years.

4. We beg to add that, on learning of the outbreak of cholera among the workpeople employed on these works, we called upon the Officiating Chief Commissioner to report what sanitary precautions or conservancy arrangements were in force for this body of workpeople. It is satisfactory to find from the reply that great care is evidently taken with regard to the conservancy of both the coolie lines and the village of Doomagoodiem, in which the men are located.

5. The revised projects for the first and second barriers are now under our consideration, and we expect to be able to submit them for your orders in the course of a few weeks.

We have, &c.
(signed) *John Lawrence.*
W. R. Mansfield.
W. Grey.
G. N. Taylor.
W. N. Massey.
H. M. Durand.

Enclosure 1, in No. 7.

(No. 1721, dated 11th July 1865.)

From Lieutenant Colonel *W. Maxwell*, R.A., Secretary to Chief Commissioner, Central Provinces, in the Public Works Department, to Secretary to Government of India, Public Works Department.

I AM directed to forward, in original, Officiating Superintending Engineer's, Upper Godavery Circle, Letter No. 300 of 13th ultimo, together with the second half-yearly Progress Report for 1864-65, and the papers enumerated at foot of that officer's letter.

2. The Officiating Chief Commissioner, in submitting these papers, would observe, that he considers the report a clear and straightforward statement of all circumstances attending these extensive works. The engineer officers in charge have doubtless done all that lay in their power; but the difficulties of labour seem to be very great, owing to the unhealthiness of the country, and other causes.

3. The delays attending the completion of even this first barrier, 20 miles in length, appear discouraging; for it is evident that no future exertions can, even under favourable circumstances, complete this one barrier under six years; it is not likely therefore, at the present rate of progress, that all these barriers, of 69 miles, will be finished much under 20 years; neither will the cost, judging from the statements submitted this day, be less than 1,000,000 *l.* sterling, including river improvements, cost of establishments, and incidental expenses. The Officiating Chief Commissioner cannot consider the present state of affairs justifies his recording an opinion, that satisfactory progress has yet been made towards opening out the Godavery to trade.

Enclosure 2, in No. 7.

(No. 300, dated 13th June 1865.)

From Major *J. Stoddard*, Officiating Superintending Engineer, Upper Godavery Circle, to Secretary to Chief Commissioner, Central Provinces, in the Public Works Department.

I HAVE the honour to forward the second half-yearly Progress Report for 1864-65. The delay in its submission is attributable to some of the statements from which it is compiled not having been received by me till yesterday.

List of Enclosures.

1. Report, corrected, received with No. 370 of 23rd June 1865.
2. Statement marked (A).
3. " " (B).
4. " " (C).
5. " " (D).
6. " " (E).
7. " " (F).
8. Seven diagrams illustrative of report.

REPORT by Major J. Stoddard, Officiating Superintending Engineer, Upper Godavery Circle, on Second Half-Yearly Progress Report, Upper Godavery, 1864-65.

THE progress made during the first half of 1864-65 was reported in my Memorandum No. 871 of the 7th December last.

First Barrier Works.

2. Accompanying the present report for the second half-year is a tabular statement marked (A), which has been prepared in accordance with the instructions contained in the letter of the Secretary to the Government of India, in the Public Works Department, dated 21st January last, No. 72—341 C.

This statement shows not only the progress on the first barrier works (at which barrier alone the navigation works have been commenced) during the period just mentioned, but it also gives the progress up to the date, *i. e.*, to 30th April 1865, from the 1st May 1863, as well as the balance of work remaining to be done.

Quantity of work performed.

At the foot of this statement an abstract is given, showing under the two principal heads of work, *viz.*, "*masonry*," and "*earth-work*," the total quantities done in each half of the past year; in the whole of the past year, and up to date respectively, as well as the balance remaining to be done out of the total quantities, under the above two heads, as taken from the revised estimates submitted on the 14th of January last.

Below this abstract again is given the *ratio* which the quantities of work done in each period, as just mentioned, and still to be done, bear to the total estimated quantities, the latter being taken 100.

Up to date.

3. From this tabular statement it will seem that up to 30th April last (that is, in *two* years), 22·42 per cent. of the masonry, and 25·7 per cent. of the *earth-work* of the *entire* works were completed, also that 1·53 and 10·01 per cent. of the above per-centages respectively were done in the past year 1864-65, which leaves 7·12; and 15·69 per cent. of *masonry* and *earth-work*, respectively, as having been done in the previous years of 1863-64.

In 1864-65.

In 1863-64.

It further appears that out of the 15·3 per cent. of masonry work done in the past years 1864-65, 12·85 were done in the *second half-year*, and only 2·45 in the *first*; and of the 10·01 of *earth-work*, 4·55, and 5·46 per cent., were performed in the second and first half of the year respectively.

Strength of working force.

4. These results, particularly as regards the quantity of *earth-work* performed in the past year (in the last half of it especially), are very far from satisfactory, and require some explanation; the more so, as the working forces during this period were much stronger than at any preceding period, as the following statement shows:—

Statement of Number of Workpeople at the close of each Month on the First Barrier Works.

1864.					1865.				
31 August	-	-	-	2,643	31 January	-	-	-	4,979
30 September	-	-	-	3,591	28 February	-	-	-	5,940
31 October	-	-	-	4,453	31 March	-	-	-	6,339
30 November	-	-	-	4,746	30 April	-	-	-	3,738
31 December	-	-	-	4,888					

Average of last six months, from November 1864 to April 1865, inclusive—5,105.

Cholera breaks out early in April.

Desertion from cholera

5. It is scarcely fair, however, to include the month of April in the foregoing statement, as very early in that month nearly all the coolies, and other natives employed on the works, left for Bruddrachellum to attend the annual festival, and the cholera having broken out during the festival, one-half of them returned to the works only to desert soon afterwards in a state of panic, while the other half were so completely demoralised through fear of that epidemic, which continued to rage fearfully, that they were unfit to do any work. Incessant processions with tom-toms, and other religious rites, became almost their sole occupation during nearly the whole of April and a great part of May.

Excluding

Excluding the month of April, the *average* number of workpeople during the other *five* months of the half-year, *i. e.*, from November 1864 to March 1865, will be about 5,400. But for the same reasons as above stated, it would also be equally unfair to include April in the working period of the last half-year, which will, therefore, be reduced from six to only five *months*, and this will, to some extent, account for the small quantity of work, especially earth-work, done in this period.

Working period reduced from same cause.

6. A further reason for the exceedingly small quantity of earth-work done to the canal in the half-year under review is, that, owing to a very large proportion of the labourers who were imported from Bangalore and Madras in October last, to these works being bricklayers, it became necessary to push on with the anicut and other masonry works in order to give them employment, and this arrangement, of course, absorbed a considerable portion of the unskilled labour also. So that as the Statement (A) discovers, while the per-centage of "masonry" work done during the second half-year was 12·85, or more than 80 per cent. *greater* than was done during the whole of 1863-64, that on the "earth-work" of the canal was but 4·55, or scarcely more than one-third only of what was performed in the previous years 1863-64.

Masonry works pushed on in preference to earth-work.

7. There is still another reason why the out-turn of work on the canal during the second half-year of 1864-65 was so insignificant, that is, the almost insuperable difficulty of inducing the coolies who came up here to work to accept contract or piece-work.

Difficulty of getting contract work done.

They are quite willing enough to work for daily wages, but it would be out of the question to get earth-work done in this fashion, as the cost would inevitably be four or five times greater than the rates allowed in the estimate.

I myself tried in every way to get a large gang of coolies from the coast to accept piece-work, but completely failed. They had apparently never been accustomed to work in gangs at contract rates, and finding that they would have to work much harder than they had intended to do when they came here, they quickly deserted the works altogether.

There are at present a few hundred men on the work who are now so accustomed to do earth-work by contract, that they steadily refuse to do any other work for daily pay.

These men came up here about two or three years ago from Madras, and they seem to have settled down here, and to have no wish to leave the works now. It is much to be desired that we could get about 3,000 such men for the canal work alone, as, under present circumstances, the masonry work will be completed years before the canal is excavated.

Increased efforts will be made to procure men of the tank-digger class, but I fear that there will be much greater difficulty since the recent outbreak of sickness up here to get labour than there ever was before.

Excavators much required for canal work.

The probable effects on the works of the cholera will be noticed further on.

8. Having shown in Statement (A.) the *quantities* of work performed, I now proceed to notice the *cost* of the same, and to compare it with the probable cost as given in the revised estimate.

Cost of work done.

In order to condense this information as much as possible, I have adopted the tabular form here also.

In the Appended Statement marked (B.) I have given in the first six columns on the left, *for all those works that have been commenced, and which are in progress*, under the two principal heads of "Masonry" and "Earth-work."

I.—The quantity as per estimate.

II.—The quantity done in 1863-64, and 1864-65 respectively.

III.—The ratio which these latter quantities bear to the former.

In the remaining columns on the right are shown—

I.—The probable estimated cost.

II.—The actual cost of work in 1863-64 and 1864-65, and the per-centage which these latter bear to the former.

9. A comparison of the figures in column 6 with those in column 12 proves that, with one exception, the cost of work done has exceeded the probable cost entered in the estimates. The exception is No. 7 or "2nd second section of canal," on which, as far as the work done is concerned, there has been a *saving* of 47½ per cent.

On the anicut the *excess* is about 26 per cent.; on the scouring sluices about 27 per cent.; on the head lock 27½ per cent.; on the 1st section of canal about 8½ per cent.; and on the single lock at Sodarum the excess is about 21½ per cent.

On comparing the figures in the same columns, *viz.* 6 and 12, as given in the Abstract at the foot of the Statement, it appears that on all the works in progress the *masonry* has cost nearly 25 per cent. more than the probable estimated cost, and that the *earthwork* has fallen below the estimate by about 30 per cent.

10. Statement (B.) also enables us to institute a comparison between the relative cost of the work done in the year 1863-64 and 1864-65.

Comparative cost in 1863-64 and 1864-65.

Comparing the figures in column 4 with those in column 10, and those in column 5 with those in column 11, the following are the results for four of the works; excess over estimate being distinguished by *plus* and saving by *minus*.

0.9. E 2 The

The head lock and single high level lock are omitted, as they were commenced in 1864-65 :—

	1863-64.	1864-65.
1. Anicut - - - - -	+ 29'90	+ 22'88
2. Scouring Sluices - - - - -	+ 23'30	+ 27'82
4. 1st Section of Canal - - - - -	— 18'90	+ 54'68
7. 2nd Section of Canal - - - - -	— 48'98	— 44'84

From the foregoing table of results, it appears that the cost of the work on anicut in 1864-65 is nearly 7 per cent. cheaper than in the preceding year.

This trifling difference is more than accounted for, however, by the fact that, in the year 1863-64, the greater part, if not indeed the whole of the foundations, of that portion of the anicut which is completed, was built, and the expense of puddle dams, baling, &c., was considerable.

In the year just past, there was nothing of this sort to be done, the work being comparatively much easier.

In the case of the scouring sluices, the cost of the work done in 1864-65 exceeds that of the previous year by $4\frac{1}{2}$ per cent.

It is to be remarked, however, that under the term *masonry*, both “rubble” and “dressed” or “cut-stone” are included, and there is a very considerable quantity of the latter in the sluices, in the floor, piers and arches, the whole of which nearly were done in 1864-65, so that the preponderance of excess in that year over the preceding, when only the rubble masonry of the foundations, and a small portion of the cut-stone floor were built, is to be expected.

In the 1st section of canal, the comparison tells most unfavourably for the past year; the cost being actually four times what it was in the preceding year.

This great difference is to be accounted for thus :—The quantity of work done in the past year was most trifling, only 10 per cent. of the total quantity, but there was a very considerable amount expended in the past year on cooly lines, which has been all charged to the cost of the work.

As the lines are occupied by the coolies who work on other works besides the canals, this charge should, properly speaking, be charged *pro rata* on the whole of the works when finished.

The expenditure on cooly lines in the past year has been very large, because the working force was much greater than it ever was before; but with ordinary care the houses ought to last some years, and such a heavy expenditure will not, it is hoped, again occur on this account.

In the 2nd section of canal, the cost of the work, both in 1863-64 and 1864-65, has been considerably below the estimate, but it was cheaper in the former year by four per cent. The cause of this difference may be owing to a slight increase in the rates, as the depth of excavation becomes greater.

From past experience, then, it would appear probable that the “masonry” work will cost from 25 to 30 per cent. *over* the estimate, and the earth-work from 25 to 30 per cent. *below* the estimate. If this be case, there is little reason to fear that the total estimate of 16½ lakhs will be exceeded, as the above sum is pretty equally divided between the “masonry” and “earth-work.”

The total of the estimates for the 1st and 2nd sections of canal is 7,63,000 rupees, and of the estimates for the whole of the masonry works is 7,76,000 rupees.

11. Still it is to be denied that the masonry work, on all the works that have been as yet commenced, has been much too expensive, and the real cause why it has been so will presently appear.

Referring again to Statement (A.) it will be seen that 156,287 cubic feet of “masonry” were built in the anicut in the second half of the past year, or from November to April. From this quantity must be deducted 34,412 cubic feet, which were done by contract, leaving 121,875 cubic feet only.

From a return obtained from the Assistant Engineer at present in charge of that work, it appears that the number of bricklayers mustered daily on the work during that period, amounted to a total of 16,639.

The quantity of work each bricklayer did per diem is, therefore, only $7\frac{1}{2}$ cubic feet on an average, or about quarter to one-third of what is generally, if not always, done in the Lower Godavery and Kistna Districts. Moreover, a bricklayer up here receives a salary averaging 15 rupees per mensem, which is the very highest salary given to a first-class stonemason on the coast.

This

Cost of masonry excessive.

Why it is so.

Number of bricklayers.

Short work done by them.

Their wages very high.

This being understood, one ceases to be surprised at the dearness of the cost of the works.

This state of things is most unsatisfactory; but owing to the peculiarly difficult circumstances in which we are placed, as regards labour for carrying on our works at all, it is not easy to apply a remedy.

Peculiarly difficult circumstances of this locality as regards labour.

The men themselves know fully well how expensive and troublesome a matter it is to obtain labour for these works, and they are not slow in resenting the infliction of a fine by mutinying on the spot. "Kind treatment," and "good wages," said Sir C. Wood, on a recent occasion in Parliament, "would be far more effectual in keeping labourers up on a work than any system of penalties and punishments that could be adopted." This is quite true: as long as the workmen up here get both "kind treatment" and "good wages," they are quite willing enough to *remain*, but they consider that they are very unkindly treated when a part of their high wages is stopped by way of fine for bad or short work, and they at once threaten to leave the work.

Doubtless the greater number of the men who come up as "bricklayers" or "stonemasons" are the dregs and bad characters of other more favoured districts, who could get no employment anywhere else, but as we cannot pick and choose our men up here we must make the most of those we have, and push on the works as fast as possible.

Sort of men who resort to these works generally.

Intractable as our workmen are, however, I am of opinion that more work could be got out of them if really good and efficient native maistries, similar to those who now hold the rank of taluq overseers in the Madras Department of Public Works, could be found who were willing to come up here, and immediately superintend the workmen. Such men, however, can always find employment in the other districts, both on the Government works and on those of the irrigation companies at Kurnool and Cuttack, and so long as they can do so, no inducements which we can offer them would tempt them to come up to such an unhealthy locality as this is. European supervision is also absolutely necessary in the direction of work and to prevent frauds, but I can clearly see that our great want here is, *native* maistries immediately over the workmen to keep them at their work.

Efficient native maistries much required.

Better than all, of course, would be the contract system, if it could be introduced, but there are so many and great obstacles in the way of any person wishing to contract in such a place as this, which do not exist in other districts, that I see no probability of the system being attempted to any considerable extent by any individual or company.

Difficulty in introducing the contract system.

12. The remarks above recorded on the small quantity of work done by bricklayers on the anicut, are equally applicable to the other masonry works in progress, and it is from the same cause that the cost of the scouring sluices, head lock, and high-level lock at Sodarum has exceeded the estimated cost to the extent shown above in para. 9. I have called the particular attention of the executive engineer to this excessive cost of the masonry work hitherto, and have directed him to impress upon his assistants and subordinates the necessity for increased exertions on their part to keep down the cost even at the risk of losing some of their workpeople. I believe that the estimate rates will be found sufficient if the workmen are compelled to do a fair day's work for the pay, and in future a more rigorous discipline must be observed towards them; most probably many of them will leave the works in the hope of being taken back on their own terms, seeing how awkwardly situated we shall be with regard to labour when they go; but perhaps when they see *we* are firm, *they* will give in. It has often occurred to me up here that if the Government would pass a legislative Act, similar to that recently passed by the Lieutenant Governor of Bengal for the protection of the Assam tea planters against losses caused by desertion of their coolies, or by their refusing or neglecting to perform a fair day's work, that matters would progress more satisfactorily than they have done hitherto.

Greater efforts to keep down costs necessary.

Captain Haig, in his letter No. 360, dated 16th September 1863, pointed out that, in the present state of the law, the disadvantages were all on the side of Government, and doubtless this is the case.

A "law" for enforcing proper amount of labour much needed up here.

Coolies readily enough make agreements to come up and work for a definite period; they always are brought up at Government expense, receiving small advances and travelling batta, but either not liking the place or the work, they desert. Should they be found, it is useless applying to the nearest magistrate for redress, as he invariably states his inability, under some regulation or other, to deal with the deserters, the "offence" or "act" of desertion having been committed up here.

Inconvenience at present felt from magistrates refusing to try runaway coolies.

It would require an army of peons to take charge of some hundreds of deserters for the purpose of escorting them up to Doomagoodiem, or rather to Sironcha, 120 miles higher up river, to be tried by the magistrate of the district.

The trouble would be enormous, as it would be impossible to prevent the coolies from running away as often as they might find opportunity while *en route*; and besides the expense of the escort, there will be the further cost of feeding the coolies on the way up; and, after all, what is to prevent them from deserting again after they have been brought back?

It would save a great deal of expense and trouble, and put a stop to much dishonesty and imposition on the part of the coolies, if the Government would pass an Act, empowering all magistrates to try and punish deserters who have broken their contracts, or absconded under advances, irrespective of the place where the offence was committed.

Amount expended
on First Barrier
Works in 1864-65.

13. The total amount expended on the first barrier works in the second half of the past year was 2,38,475 rupees, to which, if the expenditure in the first half of the year be added, the total amount expended in 1864-65 on the works was 3,81,730 rupees. A statement, marked (C.), is appended to this report, in which the heads of expenditure are given in detail.

Cost of establish-
ment.

It will be observed from this statement that the cost of establishments during the year was 19·10 per cent. on the total expenditure; this is exclusive of the medical establishment, which amounts to 2·55 per cent. more.

The total cost of engineering (construction), and medical establishments, and travelling allowances drawn in the 1st Division is 23·13 per cent. of the total expenditure on the works.

Diagrams (seven in
number) sent to
illustrate report.

14. Diagrams illustrative of this report are forwarded herewith, and a few brief remarks on the state of each work on the 30th April are given at foot of Statement (B).

Cholera breaks out
in April.

15. Mention has been already made of the recent outbreak of cholera at the first barrier, and of the desertion, in consequence, of half the working force of some 3,000 coolies.

The number of deaths could not have been short of 500, although the natives themselves say that between 600 and 700 died by it. It is known that very many cases were never reported, so fast were the poor people dying. The disease seemed to be of a very virulent type, as the mortality was 50 per cent. of the cases, and death generally occurred in from 7 to 10 hours after the person was attacked.

It was useless trying to prevent the panic-stricken people from running away, and no doubt their doing so had the effect of keeping down the mortality, which would have been awful if so large a number had not deserted.

Results to the
works.

16. The immediate disastrous results of the epidemic as regards the works, were :—

I. The almost entire loss of the month of April, during which nearly all the principal works were stopped.

II. The loss from death and desertion of fully one-half of the working force ; and

III. The consequent loss of probably several thousands of rupees, as most of the coolies who died or deserted were under advances, and their place cannot be supplied without further expenditure of money.

Prospective injuries
to the works.

As regards the prospective injury to the works, the following may be mentioned :—

I. The necessary suspension of nearly all masonry works during the rainy season. The executive engineer, while his force was large, was rapidly collecting materials, such as stone, cement, and sand, so as to be able to carry on the masonry work of the locks, which would be quite practicable in the monsoon, but the great reduction in the number of coolies caused by death and desertion has not only rendered it necessary to employ every coolie to attend the masons, so that the anicut and Lunka sluices might be put in a state of comparative safety before the floods come down, but has also made it necessary to encroach on the materials previously collected for the rainy season. Our quarries and sandbeds are in the bed of the river, and they will be flooded in a few days, and cement cannot be manufactured during the rains, as the cakes will not dry so as to admit of their being burned.

II. The head lock, which was commenced in March, and would by this time have been out of the reach of harm but for the cholera, has been left in a condition in which it is likely to be half covered up from the slopes falling in during the rains. This lock is placed in a very contracted situation, and to dispose of the enormous quantity of earth excavated from the foundations, the stuff had to be piled up in dangerous proximity to the edge of the pit. Should the slopes fall in to any great extent, the trouble and expense of removing the earth will be considerable.

III. Owing to the diminished force and the impossibility of collecting materials, it has become necessary to discharge a large number of masons who have been collected with considerable trouble and at great expense.

Lastly. The cholera will have the effect of making the Upper Godavery still more unpopular with the labouring classes than it has heretofore been. It has long had a bad name owing to the prevalence of fever in the cold season, and now its hot season will be dreaded on account of the cholera.

It will take two or three years of uninterrupted freedom from this dire epidemic to restore confidence, and it is to be hoped that such a dreadful year as this has proved will not again fall to our lot.

Fever cases.

17. Appended to this report is a statement marked (D.), showing the number of fever cases and deaths from this cause in the second half of 1864-65, embracing the worst months of the year for natives.

The total number of cases is large, but the deaths form but a small per-centage of the attacks, less than six per cent.

The admissions amount to 10 per cent. of the strength of the working forces.

18. As regards the Second Barrier Works, there is but little to be said. No sanction having been received, nothing was done. The accompanying statement marked (E.) will show the amount expended, and the nature of the work done in the year 1864-65.

The total of expenditure at the Second Barrier in the past year was 22,349 rupees.

The cost of establishments was 18,953 rupees, or 85 per cent. of the expenditure.

Lieutenants Montgomery and Harvey, of the Second Barrier Division, were employed during the months of January, February, March, and April, in making a survey for the road, proposed by the Chief Commissioner, round the third barrier, but their salaries and those of their establishments, permanent and temporary, while so employed, have been defrayed from the funds of the Second Barrier Division.

19. As this report is intended to serve the purpose of an annual return also, I shall here notice the civil and military works constructed or still in progress, at Sironcha.

These are the Deputy Commissioner's Court-house, the new District Gaol, the New Police Buildings, and the lines for the Native Infantry, together with a house for the European officers of the force.

20. The sum expended on all the above-mentioned buildings in 1864-65 was 30,905 rupees apportioned, as follows:—

	Rs.
Deputy Commissioner's Court-house - - - - -	2,024
New District Gaol - - - - -	9,587
New Police Buildings - - - - -	5,794
Native Infantry lines, and officers' quarters - - - - -	13,500
TOTAL - - - - -	Rs. 30,905

21. The Deputy Commissioner's Court-house has been completed for some time, and has been occupied since June 1864.

The expenditure in 1864-65 was chiefly on account of some furniture and fittings. The new Gaol is well advanced, and will probably be completed about the end of 1865.

The Native Infantry lines will be completed about August or September 1865.

The troops are, however, now occupying those portions already completed, as their present temporary huts were destroyed on three several occasions lately by fire, and the men were houseless.

The officers' bungalow is completed, and has been occupied for some months.

22. The operations of the Transport and Supply Department will now be noticed. During the last half of 1864-65 especially, these were of very great importance to the works.

A statement marked (F.) is appended, showing the nature and value of the purchases and sales of this department, and the work performed by the transport branch, including water and land carriage during the whole of the past year 1864-65.

23. The advantages of having such a department in connection with these works were fully felt in the past half-year, which, as is well known, embraces the greater part of the working season.

The rice crops in Bustar and Raipoor, whence our chief supplies are usually derived by means of the Brinjary traders (who receive advances of money for the purpose), were reported to have almost entirely failed; whether such was really the case or not, it soon became apparent that from some cause or other but a very small fraction of the quantity which the Brinjaries were to have brought in was all that we could hope for. It became necessary therefore to obtain rice from the coast.

The difficulty in so doing was great. The quantity required was large, as the coolies were expected to arrive in very considerable numbers; it was late in the season, and the river was unusually low this year, and was still falling rapidly.

It therefore required the utmost energy and perseverance on the part of the superintendent and subordinate officers of the Supply and Transport Department to bring up a sufficient quantity of rice to last till the next season's floods opened the river route again. The Department proved fully equal to the emergency, and in a remarkably short time, under the circumstances, a large quantity of rice was brought up, and all apprehensions of a scarcity, which at one time appeared imminent, were entirely allayed.

24. From the statement (F.), it appears that the value of the purchases made during the past year by the Supply Department amounted to 1,89,222 rupees, and that of the sales or retail to 1,67,049 rupees.

The total value of purchases and sales being 3,56,269 rupees. The principal articles purchased and retailed being of course "provisions," viz., rice and other grain, and salt. Under the head "condiments," are included curry stuffs, tobacco, &c.

The cost of the temporary establishments and labour in this branch of the Department was only 4½ per cent. of the above total value of its transactions.

Transport operations and cost.

25. In the transport branch of the Department, which is divided into two divisions, viz., *river* and *land* transport, the statement shows that the number of tons carried per mile was 5,30,437 by the river, and 79,491 by land. The average cost per ton per mile by the former being 1 anna 10³ pie, and of the latter 3 annas 11 pie.

Cost of establishment.

The cost of the permanent establishment of the Transport and Supply Department amounts to 26,284 rupees, or 5·8 per cent. of the total value of its transactions during the past year.

"Income."

The Department has received 4,000 rupees as "income" for private stores carried, and a sum of about 10,000 rupees is due to it by the Telegraph Department for the carriage of its stores.

The total "income" is therefore more than 50 per cent. of the cost of the permanent establishment.

Officers who have distinguished themselves.

26. It only remains, in conclusion, to bring to the notice of Government the names of those officers who have distinguished themselves.

Lieutenant Roberts.

Where all have done their duty in a praiseworthy manner, it is difficult to single out any one in particular; but I consider that Lieutenant Roberts, Executive Engineer, fourth grade, in charge of the third subdivision, has particularly distinguished himself in the way he has kept down the cost of work under his supervision.

The statement in paragraph 10 will show that the cost of the second section of canal, which is one of the works in Lieutenant Robert's subdivision, has been considerably below the cost entered in the estimate, which result is entirely to be attributed to the attention and care Lieutenant Roberts has bestowed on this important duty of an assistant engineer.

Mr. E. De Gronsilliers.

I would also beg to bring to the favourable notice of Government the efficient manner in which Mr. E. de Gronsilliers has performed his arduous duties as Officiating Superintendent of the Transport and Supply Department. His indefatigable labours have greatly contributed to the progress of the works.

Dr. Houston.

Doctor Houston has also established a claim to special mention for his unremitting attentions to the sick and dying during the recent epidemic. His conduct during that trying period was beyond all praise.

SHOWING QUANTITIES OF WORK done in 1864-65; Total Quantities done from 1st May 1863 up to 30th April 1865, and Balance remaining to be done of each particular Work included in the Revised Estimates for the First Barrier, Upper Godavery.

PARTICULARS OF WORKS.	QUANTITIES OF WORK DONE IN 1864-65.		Total Quantity of Work performed in Official Year 1864-65.	Total Quantity of Work performed up to Date from 1st May 1863.	Quantity remaining to be Done.	Total Quantities of Work as per last Revised Estimates.
	In Second Half-year ending 30th April 1865.	In First Half-year ending 31st October 1864.				
	<i>Cubic ft.</i>	<i>Cubic ft.</i>	<i>Cubic ft.</i>	<i>Cubic ft.</i>	<i>Cubic ft.</i>	<i>Cubic ft.</i>
1. Ancicut—Masonry	156,287	35,632	191,919	335,710*	446,965	782,675
2. Scouring Sluices—Masonry	74,198	21,939	96,137	119,960	80,225	200,185
3. Head Lock—Masonry	55,877	-	55,877	55,877	201,085	256,962
4. First Section of Canal—Earthwork	1,014,443	415,943	1,430,386	4,188,515	35,621,181	39,809,696
5. Toorbaka Escape—Masonry	nil	nil	nil	nil	116,106	116,106
6. Seethampett Lock—Masonry	nil	nil	nil	nil	154,577	154,577
7. Second Section of Canal—Earthwork	2,437,687	3,735,598	6,163,285	15,298,139	20,696,701	35,994,840
8. Buddrachelum Escape—Masonry	nil	nil	nil	nil	21,416	21,416
9. High Level Single Lock—Masonry	15,934	-	15,934	15,934	109,969	125,903
10. First Pair of Tail Locks—Masonry	nil	nil	nil	nil	213,681	213,681
11. Second Pair of Tail Locks—Masonry	nil	nil	nil	nil	213,681	213,681
12. Lowest Pair of Tail Locks—Masonry	nil	nil	nil	nil	213,681	213,681
13. Sodarum Escape—Masonry	nil	nil	nil	nil	53,008	53,008
ABSTRACT OF ABOVE.						
1. Masonry	302,296	57,571	359,867	527,481	1,824,394	2,351,875
2. Earthwork	3,452,130	4,141,541	7,593,671	19,486,654	56,318,982	75,804,536
PER-CENTAGE OF WORK DONE.						
1. Masonry	12.85	2.45	15.3	22.42	77.58	100
2. Earthwork	4.55	5.46	10.01	25.7	74.3	100

* In Captain Haig's Progress Report for 1863-64, dated 14th July 1864, a serious error was made by including 202,193 cubic feet of masonry which was done prior to 1st May 1863 on the "Ancicut," in the quantity shown as done in 1863-64. I fell into the same mistake in my report for first half-year, dated 7th December. The error has been corrected in this report, and the proper quantity done since 1st May 1863 is correctly given now, viz., 335,710 cubic feet.

J. Stoddard, Major,
Officiating Superintending Engineer, Upper Godavery Circle.

Doomagoodiem 13 June 1865.

STATEMENT (B).

SHOWING QUANTITIES OF WORK done in 1863-64 and 1864-65, and the actual Cost of the same, compared with the Quantities and Cost as given in the Revised Estimates for all those Works commenced or in progress, in First Barrier, Upper Godavery.

	Quantities as per Revised Estimates.	Quantity of Work done in 1863-64.	Quantity of Work done in 1864-65.	Per-centage of Work done in 1863-64.	Per-centage of Work done in 1864-65.	Per-centage of Work done up to Date from 1 May 1863.	Probable Cost as per Revised Estimate.	Actual Cost of Work done in 1863-64.	Actual Cost of Work done in 1864-65.	Per-centage of Cost in 1863-64.	Per-centage of Cost in 1864-65.	Per-centage of Cost up to Date from 1 May 1863.
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
PARTICULARS OF WORK.	Cubic ft.	Cubic ft.	Cubic ft.	Per cent.	Per cent.	Per cent.	Rs.	Rs.	Rs.	Per cent.	Per cent.	Per cent.
1. Anicut—Masonry - - -	782,675	143,791	191,919	18·87	24·52	42·89	2,20,914	52,718	66,567	23·86	30·13	53·99
2. Scouring Sluices—Masonry - -	200,185	23,823	96,137	11·90	48·00	59·90	71,480	10,481	43,927	14·67	61·86	76·03
3. Head Lock—Masonry - -	256,902	-	55,877	-	21·74	21·74	88,457	-	24,508	-	27·70	27·70
4. First Section of Canal—Earth- work.	39,809,696	2,758,129	1,430,386	6·93	3·60	10·53	3,95,305	23,039	22,012	5·82	5·87	11·39
7. Second Section of Canal— Earthwork.	35,994,840	9,134,854	6,163,255	25·40	17·10	42·50	3,67,669	62,684	43,406	17·05	11·80	28·85
9. High Level Single Lock—Ma- sonry.	125,903	-	15,934	-	12·65	12·65	44,161	-	6,799	-	15·39	15·39

ABSTRACT OF ABOVE.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
	Quantities as per Revised Estimates.	Quantity of Work done in 1863-64.	Quantity of Work done in 1864-65.	Per-centage of Work done in 1863-64.	Per-centage of Work done in 1864-65.	Per-centage of Work done up to Date from 1 May 1863.	Probable Cost as per Revised Estimate.	Actual Cost of Work done in 1863-64.	Actual Cost of Work done in 1864-65.	Per-centage of Cost in 1863-64.	Per-centage of Cost in 1864-65.	Per-centage of Cost up to Date from 1 May 1863.
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Masonry - - -	1,365,725	167,614	359,867	12·27	26·35	38·62	4,24,962	63,199	1,41,701	14·87	33·34	48·21
2. Earthwork - - -	75,804,536	11,892,983	7,593,671	15·68	10·02	25·70	7,62,974	85,723	65,418	11·23	8·58	19·81

No.

Remarks on state of each Work on 30th April 1863.

1. The Anicut completed for a length of 4,100 feet from left bank. A distance of 1,260 feet still to be done. Wing wall on east end raised to a height of 12 feet over crest of Anicut.
2. Eleven out of 14 arches of Scouring Sluices turned. Wing walls on both sides raised to a height of 30 feet above floor. All the arches will be turned, and the body wall built to a height of 15 feet before floods come down, and the rest as fast as possible.
3. The foundations of the Head Lock built in to an average height of three feet.
4. No portion of this Section of Canal is quite finished. It is difficult to say when it will be completed, as labour is so scarce.
7. This portion of Canal is far more advanced than the former, and will at present rate of working be completed in two and a half years.
9. Only a portion of the masonry foundations of this Lock is built. The work has been much delayed by the desertion of coolies on the outbreak of cholera. It will be completed in 1867, most probably.

STATEMENT (C).

SHOWING EXPENDITURE on each Work in First Barrier Project in 1864-65.

HEADS OF WORKS AS PER ESTIMATE.	EXPENDED IN 1864-65.		
	In First Half-year from 1st May 1864 to 31st October 1864.	In Second Half-year from 1st November 1864 to 30th April 1865.	In the whole Year.
	Rs.	Rs.	Rs.
1. Anicut - - - - -	10,834	55,733	66,567
2. Scouring Sluices - - - - -	10,233	33,594	43,827
3. Head Lock - - - - -	1,393	23,115	24,508
4. First Section of Canal - - - - -	10,007	12,005	22,012
5. Toorbaka Escape - - - - -	—	—	—
6. Serthampett Lock - - - - -	—	—	—
7. Second Section of Canal - - - - -	16,876	26,530	43,406
8. Buddrachellum Escape - - - - -	—	—	—
9. High level single Lock - - - - -	266	6,533	6,799
10. First pair of Tail Locks - - - - -	—	—	—
11. Second ditto - ditto - - - - -	—	—	—
12. Third ditto - ditto - - - - -	—	—	—
13. Sodarum Escape - - - - -	—	—	—
14. Improvements to Tramway - - - - -	5,637	4,188	9,825
15. Clearing approaches to Channel - - - - -	—	—	—
16. Accommodation for Establishments - - - - -	13,554	6,111	19,665
17. Pumping, baling, &c. - - - - -	—	—	—
<i>Miscellaneous.</i>			
Accommodation for Stores and Workshops - - -	16,093	3,680	19,773
Station Improvements - - - - -	5,812	1,469	7,281
Repairs to Steamers and Boats of Flotilla - - -	7,624	9,945	17,569
Manufacture of Tools, Plant, Machinery, and Rolling Stock, &c. - - - - -	9,004	21,730	30,734
Miscellaneous charges against Labour - - - - -	13,060	56,704	69,764
TOTAL - - - Rs.	1,20,393	2,61,337	3,81,730
Establishments (Construction), being 19·1 per cent. - - - - -	-	-	72,913
Medical Establishment - - - - -	2·55	-	9,755
Travelling Expenses - - - - -	1·48	-	5,669
23·13 per cent.			
GRAND TOTAL - - - Rs.	-	-	4,70,067

Superintending Engineer's Office,
Upper Godavery Circle, Doomagoodiem,
13 June 1865.

J. Stoddard, Major,
Officiating Superintending Engineer,
Upper Godavery Circle, Central Provinces.

PAPERS RELATING TO THE

STATEMENT (D).

SHOWING the Number of Fever Cases treated, and of Deaths, from 1st November 1864 to 1st May 1865, at Head Quarters and at Out-Stations.

	November 1864.		December 1864.		January 1865.		February 1865.		March 1865.		April 1865.		TOTAL.	
	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
1. Head Quarters - -	509	1	417	2	438	4	416	3	755	5	197	-	2,732	15
2. Nursapoor - - -	18	-	24	-	15	-	23	1	7	-	-	-	87	1
3. Buddrachellum - -	100	-	71	-	34	-	22	-	66	-	47	2	340	2
4. Gollagoodiem - - -	20	-	16	-	19	-	21	-	10	-	31	1	117	1
5. Nellipauk - - -	55	1	18	-	13	-	7	-	4	-	6	-	103	1
TOTAL - - -	702	2	546	2	519	4	489	4	842	5	281	3	3,379	20

(signed) *J. M. Houston, M. D.,*
Assistant Surgeon in Medical Charge,
Upper Godavery Circle, Public Works Department.

J. Stoddard, Major,
Officiating Superintending Engineer,
Upper Godavery Circle, Central Provinces.

Superintending Engineer's Office,
Upper Godavery Circle, Doomagoodiem,
13 June 1865.

STATEMENT (E).

SHOWING ACTUAL EXPENDITURE on all Works at Second Barrier, Upper Godavery Circle, during the Year 1864-65.

NAMES OF WORKS.	Actual Expenditure on each Work.	TOTAL of Expenditure.	Remarks.
	Rs.	Rs.	
Station improvements - - - - -	4,835	- - -	All these works completed.
Surveying operations - - - - -	282		
<i>Accommodation for Officers and Subordinates.</i>			
Bungalow and Out-houses for First Assistant Engineer -	2,477		
Ditto - ditto for Second ditto - ditto -	2,421		
Ditto - ditto for Subordinates - - - -	1,343		
Powder Magazine - - - - -	650		
Store Building - - - - -	217		
Telegraph Office (temporary) - - - - -	240		
Houses for Office Establishments, &c. - - - -	1,553		
Removing materials of 9½ miles of Tramway, and clearing rest of grass - - - - -	875	22,349	
Repairing Bungalow at Bodaigudiem - - - -	137		
Materials manufactured, stores purchased, and contingencies	7,419	31,409	
Add, Expenditure on Civil and Military Buildings in Sironcha Subdivision - - - - -	- - -		
TOTAL - - -	Rs.	53,758	
Establishments (Construction) being 35½ per cent.			
Ditto - (Medical) being 2½ „			
GRAND TOTAL of Expenditure in 1864-65 - - -	Rs.		

J. Stoddard, Major,
Officiating Superintending Engineer,
Upper Godavery Circle, Central Provinces.

Superintending Engineer's Office,
Upper Godavery Circle, Doomagoodiem,
13 June 1865.

STATEMENT (F).

OPERATIONS of the Supply and Transport Department, Upper Godavery Circle, during the
Year 1864-65.

ARTICULARS.	Value.	TOTAL.	Per-centage.	Tons carried.	Miles carried.	Tons carried for one Mile.	Cost per Ton per Mile.	REMARKS.
I. PURCHASES.	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>						
Provisions - - -	1,60,306 14 5							
Articles - - -	14,098 7 10							
Articles of all kinds - - -	4,093 14 8							
Stores - - -	3,037 7 2							
Stock - - -	916 3 3							
Stock - - -	5,657 4 2							
Stock - - -	605 6 -							
Stock - - -	504 - -	1,89,219 9 6	—	—	—	—	—	
II. SALES.								
Provisions - - -	1,51,478 4 7							
Articles - - -	6,401 5 8							
Articles of all kinds - - -	4,807 5 2							
Stores - - -	3,233 8 4							
Stock - - -	916 3 3	- - -	- -	-	-	-	-	Transferred to Hospi- tal Subdivision.
Stock - - -	36 - -							
Stock - - -	35 - -							
Stock - - -	141 - -	1,67,048 11 -	—	—	—	—	—	
Temporary Establish- ment, Labour and Sundries on "Pur- chases" and "Sales"	16,497 8 10	16,497 8 10	4.63	-	-	—	-	
RIVER TRANSPORT.								
1st Reach.								
Provision and Labour -	45,608 9 9	45,608 9 9	-	75 216½ 3,360	24 58 128	4,44,437	a. 1.64	
2nd Reach.								
Provision and Labour -	11,226 2 5	11,226 2 5	-	182 90 2,500 594	85 52 24 10	86,090	a. 2.09	
LAND TRANSPORT.								
Pay, 1st Barrier - -	14,966 15 5			2,319 2,960 23 147½ 2½	19 8½ 100 107 60			
Pay, 2nd Barrier - -	58 1 11			24½ 6½ 7½ 9½ 3½ 21½ 36½ 5 7½ 12	56 50 42 38 40 32 30 24 20 10	79,491	a. 3.92	
Land Carriage - -	4,495 6 -	19,520 7 4	-					
MISCELLANEOUS.								
Establishment - -	1,111 2 11	- - -	- -	317	-	-	-	Government Stores; no account kept of pri- vate passengers.
Stores to Steamers and Boats - - -	2,327 15 7							
Accommodation for Estab- lishment - - -	198 10 6							
Stores - - -	97 10 1	3,735 7 1						
GRAND TOTAL - Rs.	- - -	4,52,856 7 11						
PERMANENT ESTAB- LISHMENT.								
Stores - - -	26,284 - -	26,284 - -	5.8	-	-	-	-	This includes sales; if excluded, the Estab- lishment will have on the Total Expendi- ture 9.2 per cent.

E. De Gronsilliers,
Officiating Superintending Transport and Supply Department,
Upper Godavery Circle.

J. Stoddard, Major,
Officiating Superintending Engineer, Upper Godavery Circle,
Central Provinces.

Superintending Engineer's Office,
Upper Godavery Circle, Doomagoodiem, 13 June 1865.

Enclosure 3, in No. 7.

(No. 788 C, dated 7th August 1865.)

From Lieutenant-Colonel *C. H. Dickens*, R. A., Secretary to Government of India, Public Works Department, to Officiating Chief Commissioner, Central Provinces.

I AM directed to acknowledge the receipt of your Excellency's letter, No. 1721, dated the 11th July 1865, forwarding Progress Report of the Godavery Works for the half-year ending 30th April 1865, and in reply to communicate the commendation of the Governor General in Council on Major Stoddard's clear report, and on the exertions of all the officers employed under him, under circumstances of so much difficulty and discouragement as are reported to have occurred.

2. It is observed from your Secretary's letter, that you look to the entire completion of the three barriers of the river as the goal to be arrived at, and you calculate that it will take 20 years to do this; the Governor General in Council desires me to point out that this calculation is mistaken in two ways; first, it assumes that the Government is to attempt only one barrier at a time, instead of going on with all at once, which might be the right thing if the whole work were to be attempted; and secondly, it assumes that the Government is going to attempt the whole three barriers, and must do so before any result is arrived at, whereas it is not at present intended to carry out more than Mr. Temple's modification of the project, viz., two barriers and a road to Chanda.* There is no reason, his Excellency in Council observes, why these should not be finished within four or five years after the work being put in hand, if funds are forthcoming.

3. The Progress Report will be forwarded to the Secretary of State.

* Resolution, No. 5088 of 29 December 1862.
Letter No. 1388 of 14 July 1863.
Letter No. 422 C, of 22 July 1864.

Enclosure 4, in No. 7.

(No. 260.)

From Lieutenant Colonel *W. Maxwell*, R. A., Secretary to Chief Commissioner, Central Provinces, Public Works Department, to Lieutenant Colonel *C. H. Dickens*, R. A., Secretary to the Government of India, Public Works Department, Simla.

Office of Secretary to Chief Commissioner, Central Provinces,
Public Works Department, Nagpore, 13 May 1865.
Sir,
Establishment. I AM directed to forward, in original, a letter, No. 1508, dated 12th ultimo, from the officiating superintending engineer, Upper Godavery Circle, reporting that cholera had broken out among the workpeople at the first barrier.

2. Under dates the 18th and 19th idem, the officiating superintending engineer reported that cholera was still raging with great severity; there had been from the first 286 admissions, and 152 of them had ended fatally; the coolies were being broken up into small parties, and encamped in the neighbourhood.

3. In a letter dated 26th idem, the officiating superintending engineer reports that there is an improvement in the health of the people, and that the disease was dying out; 577 cases of cholera had occurred in all, of whom 287 had died. No case of cholera had occurred among the Europeans.

4. The works have suffered greatly. Major Stoddard says that before the breaking out of cholera there were between 6,000 and 7,000 workpeople employed, and everything seemed encouraging; but that his prospects during the remainder of the working season were gloomy.

5. Should the disease not cease a further communication will be made.

I have, &c.
(signed) *William Maxwell*, Lieut. Col., R. A.,
Secretary to Chief Commissioner, Central Provinces,
Public Works Department.

Enclosure 5, in No. 7.

(No. 1508.)

From Major *J. Stoddard*, Officiating Superintending Engineer, Upper Godavery Circle, to the Secretary Chief Commissioner, Central Provinces, Public Works Department.

Superintending Engineer's Office, Upper Godavery Circle,
Doomagoodiem, 12 April 1865.

Sir,

I REGRET to have to report, for the information of the Chief Commissioner, that cholera has broken out amongst our workpeople at this barrier.

It first broke out on the 5th instant, at Buddrachellum, during the annual festival. Many of our workpeople attended at that festival, and brought the disease to this place and the out-stations. * 12 April, noon.

Up to this date* 127 cases have been reported, of which 59 have died.

It is to be feared that it is on the increase, in which case most of our coolies will doubtless run away, panic-stricken.

I shall not fail to keep the Chief Commissioner informed as to the progress of the disease.

I have, &c.
(signed) *J. Stoddard*, Major,
Officiating Superintending Engineer,
Upper Godavery Circle.

Enclosure 6, in No. 7.

(No. 541 C.)

From the Secretary to the Government of India, to the Chief Commissioner of the Central Provinces.

Public Works Department, Simla,
30 May 1865.

Civil works.—Communications.

Sir,

WITH reference to your letter, No. 260, dated 13th May 1865, reporting the outbreak of cholera amongst the workmen at the first barrier, Godavery works, I am directed to inquire what sanitary precautions or conservancy arrangements were in force for this large body of workmen.

2. I am also to enclose copy of a telegram on the subject, which was despatched on the 27th instant.

I have, &c.
(signed) *C. H. Dickens*, Lieut. Col. R. A.,
Secretary to the Government of India.

From Colonel *Dickens* to Chief Commissioner, Nagpoor.

IF the cholera has not ceased amongst the workmen at the Godavery works, the gangs should be broken up; the sick being kept and cared for by the medical officers.

Enclosure 7, in No. 7.

(No. 1846, dated 15th July 1865.)

From Lieutenant-Colonel *W. Maxwell*, R.A., Secretary to Chief Commissioner, Central Provinces, in the Public Works Department, to Secretary to Government of India, Public Works Department.

I AM directed, in reply to your letter No. 541 C, of 30th May last, asking what sanitary precautions or conservancy arrangements were in force for the workmen at Doomagoodium when cholera broke out amongst them last April, to forward copies of Superintending and Executive Engineer's Nos. 424 and 263, of 29th and 27th ultimo, explaining all arrangements; and to state that the Chief Commissioner considers all reasonable precautions against an outbreak of sickness seem to have been taken.

Enclosure 8, in No. 7.

(No. 424, dated 29th June 1865.)

From Major *J. Stoddard*, Officiating Superintending Engineer, Upper Godavery Circle, to Secretary to Chief Commissioner, Central Provinces, in the Public Works Department.

I HAVE the honour to acknowledge your memorandum, No. 869, dated 12th instant, forwarding copy of a letter from the Secretary to the Government of India, Department of Public Works, No. 541, dated 30th ultimo, inquiring what sanitary precautions or conservancy arrangements were in force for the workmen in this division when the cholera recently broke out amongst them.

No. 263, dated
27 June 1865.

2. In reply, I beg to forward copy of a letter from the Executive Engineer, in whose immediate charge the several cooly lines and village of Doomagoodium are placed, and by whose orders, at the suggestion of the medical officer, all sanitary references are carried out in them.

3. From my own observation, I can, without hesitation, endorse Mr. Isaac's opinion that more sanitary attention is paid to Doomagoodium, and the coolies' lines than to any village in India.

Mr. Isaac has forgotten to mention that several public latrines are established in the vicinity of the lines, and to these the coolies are compelled to resort as much as possible.

4. There is no doubt but that the disease was brought up here by the pilgrims who came to the Buddrechellum festival, as I at first stated when reporting the appearance of the epidemic.

5. In my letter No. 339, dated the 19th instant, I have mentioned what measures were found most efficacious in abating the disease after it had commenced its ravages, the chief of them being breaking up the gangs, and dispersing them into separate camps.

Enclosure 9, in No. 7.

(No. 263, dated 27th June 1865.)

From *T. Isaac*, Esq., c. e., Executive Engineer, First Barrier Division, to Superintending Engineer, Upper Godavery Circle.

I HAVE the honour to acknowledge receipt of your No. 371 of 23rd instant, and its enclosure, asking what sanitary precautions or conservancy arrangements were in force at the first barrier division for the large body of workmen employed here before the outbreak of the cholera, and, in reply, beg to submit the following information:—

The coolies reside in comfortable lines constructed by the department. These lines average about 150 feet long by 20 feet wide, and are divided into compartments about 10 feet square. A family is permitted to occupy one compartment. No more than four single coolies are expected to live in one compartment.

The lines are constructed on selected localities, and are kept well apart, both to facilitate ventilation and to avoid the risk of fire spreading in case fire should break out.

The lines are well drained, and at each cluster of lines a conservancy force is maintained to keep the locality clean; each conservancy force consists of a maistry and a set of peons, who watch night and day to enforce sanitary orders issued with the approval of the medical officer, and to prevent the commission of nuisances; and a set of sweepers is also maintained, who are constantly employed in removing all rubbish and filth.

The same measures are adopted in the village of Doomagoodium, which is occupied by persons more or less connected with the works; and although the houses in the village are nearly all private property, yet summary measures are taken to remove all obstructions to thorough ventilation, and to enforce cleanliness.

I think there are few, if any, villages in India that receive more sanitary attention than the village of Doomagoodium, and the cooly lines of this division. There is certainly no division in which greater care and attention is paid to the comfort of coolies or where they are so well looked after, both in health and sickness.

Unfortunately for the progress of these works, a large religious festival is held annually at Budrachellum in the month of April, the very season when cholera is almost more or less prevalent in some one or other of the coast districts. The festival is regularly attended by large numbers from all parts of the coast region, and the cholera was undoubtedly brought this season to Budrachellum by some of the pilgrims from a distance. It first appeared in this division at Budrachellum, during the feast; and as large numbers of the labourers attended the feast, it was carried by them to their homes.

This is, I believe, the second time that the cholera has interfered with the progress of the Upper Godavery works, and, under existing circumstances, there is every reason to apprehend that the works will be liable to frequent, if not annual, interruptions from the recurrence of this deadly disease.

— No. 8. —

(Public Works Department.—No. 116 of 1865.)

To the Right Honourable Sir *Charles Wood*, Bart., G.C.B., Secretary of State for India.

Sir,

Simla, 13 September 1865.

REFERRING to your Despatch, No. 62, of the 17th November last, we have now the honour to submit a resolution reviewing the state of the expenditure and prospective measures to be adopted, if it be considered advisable to carry on the works for the navigation of the Upper Godavery, to the extent which was formerly recommended by us and approved by Her Majesty's Government.

Civil Works.
Communications.

2. It will be perceived that we have now before us definite and detailed plans and estimates for the works at the first and second barriers. And although we have not yet obtained full details of information and estimates for other parts of the project, the estimates for these principal parts appear to be sufficient to enable us to lay the state of the case before you, so as to obtain orders upon the main point as to whether the works shall be proceeded with to completion, and whether simultaneously along the whole line, or by sections.

3. It will be remembered that the series of works which it was previously determined to undertake, was that embraced in the minor project recommended by Mr. Temple, viz.:

- I. The first barrier works ;
- II. The second barrier works ;
- III. A road from the foot of the third barrier to Chanda ;

together with such works between the barriers as might suffice to render the navigation safe and easy for the four or five months during which the natural supply of water in the river would be sufficient for this purpose.

4. The works required below the first, and between the first and second barriers, are known to be of trifling cost, and the river is already navigable for steamers in these reaches. The works between the second and third barriers were estimated roughly to cost $6\frac{1}{2}$ lakhs of rupees (65,000 £.), of which we have received no later or more precise estimate. The rough estimate, however, was made in contemplation of navigation for the entire year, while it is known that the river in this reach is already navigable for steamers for part of the year. Hence we do not apprehend any increase of the estimate for providing safe navigation for four or five months. It would have been more satisfactory to have had precise and definite plans and estimates for all these intermediate works. But the unhealthy climate and wild and difficult nature of the country must be considered in excuse of the want of these. We propose, therefore, to insist on obtaining these precise estimates before the works are finally set in hand on any increased scale of expenditure (if such should be your decision) ; but it seems unnecessary to delay longer on this account before laying the matter before you for orders.

5. In regard to the road to Chanda, the case is the same. Some progress in the survey was made last season, but detailed estimates have not yet been prepared. A road, however, is a comparatively simple work, and we have experience of the cost of roads in the southern portion of the Central Provinces and reaching to Chanda, which enables us to judge fairly of what the cost would be of continuing this species of communication thence to the foot of the third barrier, or onwards to Seroncha. By taking a high average cost per mile, derived from this experience, we gain a tolerably safe estimate on which to base our calculations.

6. Before leaving this part of the subject, we would remark that we do not consider that the administration of the Central Provinces is to blame in regard to the want of estimates. During the first season that the works were under that administration, a revised estimate for the first barrier works was prepared. During the next season the detailed project for the second barrier was prepared, and in the third season (that now just terminated), the survey necessary for the

road project was put in hand, and was only discontinued because we considered it necessary to reduce the cost of the establishments employed on the Godavery Works, pending a decision as to the scale on which they were to be carried on.

7. Of the two detailed projects which have been received, we would remark that that for the works at the first barrier seems to embrace a greater expenditure than might have been necessary, had our intention of not attempting to provide more than four or five months' navigation been carefully attended to from the first. But the work has been so far carried out, that we would not recommend any other reduction than the cutting off the greater part of the canal, and connecting the navigation of the river above the dam with that below it, by a short canal of three miles, with a lock for steamers, instead of completing the long canal of 25 miles. This modification is now recommended by Captain Haig himself.

8. The project for the second barrier, we think, may be entirely accepted, with some trifling modifications of detail.

9. In the case of both these estimates, it will be seen that we have caused calculations to be made of the enhanced cost of the works, which the prices actually ascertained from the latest accounts seemed to indicate. Thus the estimates may be considered as reliable as, in such cases, estimates usually are.

10. The entire expenditure up to date, it will be observed, has mounted up to 286,075 *l.*, and the cost of the entire series of works contemplated can scarcely be under 800,000 *l.*; while considering how apt the expenditure is, in such cases, to outrun even the most carefully framed estimates, we cannot but state that we think it quite possible that the cost of the works in the end may come up to a million and a quarter sterling.

11. And further, when done, the work will not provide what has been contemplated by the projectors of the scheme, a navigation of the Godavery for the entire year, but only for four or five months; so that there is still to be contemplated the possibility of the Government being urged to perfect the work; and not only to carry the navigation past the third barrier, and up the Wurda, but also to store up water to supply the works during the dry season, and to extend the navigation throughout the year. To do this, would, we think, not cost less than a million or a million and a half more than the scheme we formerly adopted with your approval.

12. When originally proposed, the entire series of works was estimated at 300,000 *l.* to provide this complete navigation. It now appears that the sum originally contemplated has been all but spent, while the work required at the first barrier is not more than half done, and none of the other works have yet been touched; and that, to complete the whole series of works as originally contemplated, there must be expended at least a million and a half more—perhaps two millions and a half. Under these circumstances, it seems quite clear that the Government should entirely disclaim any intention of proceeding beyond the series of works contemplated in para. 3 of this Despatch.

13. But with regard to persevering with the works to this extent, and whether they should be proceeded with one by one, or all at once, there is room for difference of opinion.

14. On the one hand it may be said, to use a common phrase, that there is no use in throwing good money after bad, and that it will be best to abandon at once these works, which have proved, and promise to prove, so expensive, and which, passing through an unhealthy wilderness, are not urgently required in comparison with others from which immediate results may be obtained. Admitting that there is much force in this line of argument, we are not disposed, on the whole, to abandon the works. They have been deliberately undertaken by the Government, and though they have proved, and are likely to prove, greatly more expensive than was anticipated, still there has nothing yet occurred to show that, after all, they may not be successful, and successful at a cost which, though very high, may yet not be higher than the ultimate worth of the line of communication. And again, though but little has been realised for the money spent, experience has been gained, and something has been done; and there is a better prospect now than heretofore, that the works may be carried forward with

regularity



regularity and economy on detailed projects and estimates, which have at length been submitted for the principal works.

15. Concluding, then, that it is desirable to persevere with the works, we come next to consider whether it will be best merely to go on for the present with the works already in progress at the first barrier, and not begin any others till these have been satisfactorily completed, or to proceed at once with the works along the whole line, to open it out as rapidly as is reasonably possible. It is to be observed that there is no prospect of any local traffic at first. The whole country is a wild jungle, and almost without population; and if any population and wealth should hereafter be developed, it will be slowly brought about by means of the traffic. The completion of the first barrier works alone, therefore, would lead to no result, except to test the success of the project as an engineering work. Such a test would doubtless be valuable in a general way. But the works at the first barrier are not exactly similar to those proposed for the second barrier, and have no resemblance to any of the other works required to complete the project. We think, therefore, that the value of the test which would thus be obtained is hardly sufficient to justify the delay which such a course of procedure would involve. It will probably take three years to complete the first barrier works, and five or six years to complete those of the second barrier, and also about the same period to complete the road. If all are proceeded with together, the outlay will begin to bear fruit at the end, say, of six years. But if the works on the first barrier be completed first, it will be nine years before any result is arrived at; and all that time the money already spent will remain sunk and unproductive.

16. It may no doubt be said that the oscillation of views and changes of plans by the engineers indicate anything but a stable and satisfactory appreciation of the best mode of solving the problem the solution of which has been entered upon. These changes have continued up to almost the last moment, in regard to the works embraced in the detailed projects which have been submitted; and for the secondary portions of the general project, detailed designs are not as yet obtained. It may, therefore, be urged that it is most desirable to see one section, at the first barrier, really done, and well done, before going on to a second. Again, it may be added that all labour has to be imported from a distance, and that, therefore, there would be much advantage in concentrating available means on one section, and no small economy, not only by avoiding the competition in the labour market from distinct centres of works, but also by the smaller and more compact establishments necessary for a single section. Further, it may be said that, if there were a large mercantile population on the banks of the Godavery waiting, with teeming produce, the opening of the line of communication, it might be advisable to risk a similar waste of money to that which has already taken place on imperfectly matured operations. But there is no such excuse for haste. The traffic has to be created; and anyone who knows the country must be aware that it will take years to call into life that of which there is now little or no trace. Except in the anticipation of a distant future, the proceeds of the undertaking are not encouraging; and as the returns must be remote, there is no inducement to precipitate progress at the risk of the soundness of the engineering operations.

17. In this there is no doubt much force; but from the best information obtainable, it appears that labour may be procured for works at the second barrier without drawing much upon the sources depended upon for procuring it for the completion of the works at the first barrier; and this being the case, we, on the whole, attach more weight to the consideration of realising an early return for the outlay, than to the arguments for proceeding more cautiously, but more slowly. It is true that there has been much oscillation of opinion as to the projects; but now that those for the main works have been received in full detail, we believe that there is some security for their stability. The details still wanting may be obtained in time to secure their being properly worked out before the work is actually set in hand. And we are, on the whole, disposed to recommend that the work should be carried on simultaneously along the entire line of works, as soon as the proper detailed estimates are received and approved.

18. But while, on the whole, we incline to this opinion, we adopt it with some
 o.g. G 2 hesitation,

hesitation, and propose to obtain a report from engineers of reputation and experience in hydraulic engineering, who shall visit the site of the works and report on the work done, the work in progress, and the work required to complete the project. We may hope to receive this report soon after hearing your views upon the subject of prosecuting these works. Should you concur generally in our view, and should the engineers report favourably, we may then, with some degree of confidence, proceed to make arrangements to carry forward the works. But should there be reason so to do, we would refer again to you after receiving the report of the engineers, before doing anything further.

19. If you should agree with us in preferring to go on with the works, we would request that the necessary instructions may be given to Captain Haig, now on leave in England, in regard to procuring the steamers, plant, &c., required for the second barrier works. We may mention that the report of the engineers to be deputed to visit the sites of the works, can hardly be obtained by us before April or May next; and if you think it best to wait for it before taking any steps in regard to procuring the steamers, &c., it may be well to consider whether Captain Haig should not be detained in England till you are in a position to give him instructions on the subject.

20. We have had our resolution, which accompanies this Despatch, printed at Simla; but the documents which are referred to in it are so bulky that it has been necessary to send them to Calcutta to be printed. They will follow as soon as possible.

We have, &c.
(signed) *John Lawrence.*
W. R. Mansfield.
W. Grey.
G. N. Taylor.
W. N. Massey.
H. M. Durand.

Enclosure in No. 8.

(Nos. 930-3 C.)

PROCEEDINGS OF THE RIGHT HON. THE GOVERNOR GENERAL OF INDIA IN COUNCIL.

Public Works Department, Simla,
13 September 1865.

Projects for Works of Navigation on the Upper Godavery.

READ again—

Civil Works.

Communications.

Resolution No. 5088—90 A. of 29th December 1862, on the subject of the transfer of the Godavery Works to the Central Provinces. [*Proceedings, Communications, December 1862, No. 57.*]

Letter to the Chief Commissioner of the Central Provinces, No. 1388 of 14th July 1863, approving of the suggestion in Mr. Temple's Report on the Godavery. [*Governor General's Proceedings, Communications, July 1863, No. 5.*]

Letter to the Chief Commissioner of the Central Provinces, No. 422 C. of 22nd July 1864, re-affirming that decision. [*Proceedings, Communications, July 1864, No. 18.*]

Read also the following papers :—

Connected with the First Barrier Works.

Secretary to the Chief Commissioner of the Central Provinces, No. 1066 of 15th October 1863, forwarding plans and estimates for the first barrier works. [Received 21st June 1864.]

Secretary to the Chief Commissioner of the Central Provinces, No. 1736 of 4th August 1864, forwarding duplicate copy of Captain Haig's No. 333 of 1st September 1863, on the subject of the first barrier project.

Secretary to the Chief Commissioner of the Central Provinces, No. 909 of 24th June 1864, forwarding Captain Haig's No. 1236 of 26th April 1864, proposing a modification of the first barrier project.

Secretary

Secretary to the Chief Commissioner of the Central Provinces, No. 1514 of 27th July 1864, forwarding a communication from Captain Haig, supplying certain information regarding the Godavery River.

Secretary to the Chief Commissioner of the Central Provinces, No. 3168 of 26th September 1864, forwards certain particulars regarding the flood levels of the Godavery.

Secretary to the Chief Commissioner of the Central Provinces, No. 1209 dated 5th December 1863, regarding size of locks on the Godavery. [Received 1st July 1864.]

Secretary to the Chief Commissioner of the Central Provinces, No. 7538-2684, dated 10th March 1865, reporting sanction to the prosecution of the locks on the first barrier canal.

Public Works Department Telegram No. 44, dated 20th March 1865, sanctioning above.

Secretary to the Chief Commissioner of the Central Provinces, No. 442 of 20th May 1865, submitting revised project for works at the first barrier.

Connected with the Second Barrier Works.

Secretary to the Chief Commissioner of the Central Provinces, No. 996 A. of 4th July 1864, forwarding plans and estimates for the works at the second barrier.

Letter from Secretary to the Chief Commissioner of the Central Provinces, No. 1342, dated 15th July 1864, submitting proposals for the prosecution of the work on the second barrier.

Secretary to the Chief Commissioner of the Central Provinces, No. 1935 of 12th August 1864, forwarding copy of Captain Haig's No. 467 of 22nd October 1865, reporting on the works proposed for the second barrier.

Secretary to the Chief Commissioner of the Central Provinces, No. 2860-701 of 15th September 1864, forwarding proposal by Captain Haig for procuring steamers, machinery, and plant from England for the second barrier.

Secretary to the Chief Commissioner of the Central Provinces, No. 5094 A., dated 6th December 1864, with accompaniments, submitting estimate for works supplementary to the project for the second barrier. [Received on the 1st June 1865, with Memo. No. 523, dated 26th May 1865.]

Connected with the Extension of the Communication to the North-west, the Question of Establishments, &c.

Secretary to the Chief Commissioner of the Central Provinces, No. 1398-155, dated 21st July 1864, regarding the Upper Godavery Circle Establishment.

Secretary to the Chief Commissioner of the Central Provinces, No. 3699-1040, dated 14th October 1864, on the same subject.

Secretary to the Chief Commissioner of the Central Provinces, No. 7791 A. of 18th March 1865, reporting on the Transport and Supply Department.

Despatch from Her Majesty's Secretary of State, No. 62, of 17th November, 1864, remarking on the progress report of the first barrier works.

Secretary to the Chief Commissioner of the Central Provinces, No. 1479, dated 26th July 1864, on the further prosecution of the inquiries in regard to the Godavery project.

Secretary to the Chief Commissioner of the Central Provinces, No. 4745, dated 6th January 1865, reporting arrangements made for the survey of the road from Chanda to the foot of the third barrier. [*Establishment Proceedings, February 1865, No. 41. Part B.*]

Public Works Department to Chief Commissioner of the Central Provinces, No. 165 E., dated 28th January 1865, approving of the steps taken. [*Establishment Proceedings, February 1865, No. 42.—Part B.*]

Observations.—The control of the works for opening out the navigation of the Upper Godavery was transferred from the Madras Government to the Chief Commissioner of the Central Provinces, from 1st May 1863. In the resolution of the 29th December 1862, in which, with the approval of the Secretary of State for India, this transfer was ordered, the Government of India approved of the suggestion made by Mr. Temple (Officiating Chief Commissioner), to confine the works for the present to the opening out of the first and second barriers, and carrying the navigation up to the foot of the third barrier

* No. 1388, dated
14th July 1863.

2. On receipt of Mr. Temple's more detailed report on the Godavery, the Government of India * reaffirmed this decision, and at the same time agreed in the necessity for constructing a road from the foot of the third barrier to Chanda, to complete the connection of the navigation with the road system of the Central Provinces, and open the communication with the cotton-bearing districts south of Nagpore.

3. It was at the same time laid down that the navigation works were not expected to be open for more than four or five months of the year (during the rainy season), owing to the deficiency of the natural water supply of the river; and that for the present, agreeably with Mr. Temple's suggestions, the Government of India was not disposed to prosecute any works for increasing the natural supply of the dry season.

4. The works which it was proposed to undertake were at that time roughly estimated to cost the following sums:—

	£.
First barrier works - - - - -	120,000
Second - ditto - - - - -	70,000
Works below foot of third barrier - - - - -	65,000
Road to Chanda - - - - -	45,000
TOTAL - - - - £.	300,000

5. The opinion of Captain Haig, R. E., the superintending engineer and original projector of the works, was, however, invited on the subject of limiting the project, and after receipt of his report, with Mr. Temple's remarks thereon, the above determination of the Government of India was again affirmed in a letter No. 422 C., dated 22nd July 1864. The approval of the Secretary of State had, in the meantime, been given to the same decision.

6. In all these communications on the subject of the Godavery works, the Government of India strongly urged the necessity for the early submission of definite and complete designs and estimates; and although the works commenced in 1861 on the first barrier were allowed to go on, pending the revision of the first estimate, no other work was to be commenced until after the submission of detailed and definite projects.

7. On the 26th July 1864, the Chief Commissioner forwarded an explanation of the delays which had occurred in the preparation and submission of the projects, and furnished other information called for, and explained the steps which had been taken, and were recommended for the completion of the information required by the Government of India.

8. About the same time the detailed projects for the first and second barriers were received, and a further revised project for the first barrier has since been submitted as promised.

9. The receipt of the detailed estimates for these projects now enables the Government of India to revise the general estimate of the entire cost of the works as contemplated for early construction. And it may be added that, in regard to the cost of the road, recent experience shows that in the Central Provinces a road which must be available for heavy traffic, especially in the rainy season while the river is to be open, cannot be constructed under 1,000 £. per mile, and it may be safer to estimate its cost at 1,200 £. Further, it seems necessary to carry the communication to the civil station of Seroncha, which is some miles lower down the Godavery than the foot of the third barrier. On the whole, the cost of the scheme of works now contemplated is likely to be as follows:—

	£.
First barrier works - - - - -	105,000
Second - ditto - - - - -	130,000
Works between second and third barriers - - - - -	65,000
Road, 125 miles at 1,200 £. - - - - -	150,000
Total - £.	450,000
Of this, work has been done to the extent of about - - -	60,000
Leaving still to be carried out - £.	390,000

10. But to this the charge of establishments must be added, which, on these works, must include a medical establishment, and the establishment for working the steamers and supplying provisions. Also, provision must be made, both in additional pay and additional numbers, for the prevalence of sickness. Thus the establishment altogether will come to about 25 per cent. of the entire outlay, or, which is the same thing, to 33½ per cent. on the cost of the works as estimated, exclusive of establishment.

	£.
Thus, to - - - - -	390,000
Add 33½ per cent. - - - - -	130,000
And the result gives the total sum still to be spent, as £.	520,000

11. In part of this sum an assignment of 55,000 £. has been made in the Public Works Budget Estimate of the Central Provinces for 1855-56; and the balance of 465,000 £. has still to be provided in future years.

12. Before proceeding to contemplate the provision of the outlay for the future, it will be well first to review the expenditure already incurred.

13. An account received from the Madras Government gives the expenditure, prior to 1st May 1863, as follows:—

	£.
1855-56-57 - - - - -	13,347
1859-60-61 - - - - -	7,926
1861-62 - - - - -	36,179
1862-63 - - - - -	56,697
Captain Haig's supplemental account - - - - -	37,403
Total - £.	151,562

The account from the Central Provinces for the succeeding two years is—

	£.
1863-64 - - - - -	55,662
1864-65 - - - - -	78,951
Total - £.	134,513
Making the entire expenditure, up to May 1865 - £.	286,075

14. The record of the expenditure is so far defective as not to admit of a satisfactory analysis. But as far as can be made out, the following are the main heads of charge:—

	£.
Tramways - - - - -	52,335
Improvements in river bed - - - - -	6,001
First Barrier Works.	
Before 1st May 1863 - - - - -	£. 41,156
Since ditto - - - - -	44,711
	85,867
Second Barrier, preliminary charges - - - - -	9,878
Establishment charges assumed as one-fourth of the entire expenditure - - - - -	71,519
Balance apparently representing steamer block,* materials, and advances outstanding - - - - -	59,875
Total - £.	286,075

15. The charge for tramways is due to the first intention of the Madras Government, on commencing the works in 1861, to construct tramways round the barriers before the navigation works were completed, so as to secure a temporary communication at an early date. This plan was given up after Mr. Temple's visit to the works in August 1863. It is further to be remarked that the work done on the first barrier, prior to May 1863, is exclusive of that included in the late revised project, which only includes work remaining to be done on that date. How much of the old work is utilised in the new project has not been distinctly reported.

16. The Chief Commissioner of the Central Provinces has been requested† to have the accounts more completely analysed, and to submit a fresh abstract account showing distinctly the charges,—(A), for abandoned work in the tramways and in the first barrier; (B), for work which is to form part of the final project now in course of execution at that barrier; (C), for establishment exclusive of all other charges; (D), for the block of the steamers and cargo-boats, and for machinery and tools; (E), for materials available for use on the works; and (F), for advances and materials which cannot be worked off, and are therefore contingent charges on the works. It is believed that the defect in the accounts is not in the original record, but only in the abstracts submitted to the Government of India.

† Letter No. 747A., dated 17th August 1865.

17. As the account stands, however, it is clear that on the whole the expenditure which has already taken place, is all but the full sum originally contemplated by Mr. Temple as sufficient to complete the series of works to the extent recommended by him. And yet not more than half the work required at the first barrier, according to the latest returns, is yet done; and none of the other works have as yet been touched.

18. This

* The flotilla now employed consists of eight steamers and 22 cargo-boats. The reported value of the eight steamers is 12,594 £. See Report from the Central Provinces, No. 7,791 A., dated 18th March 1865.

18. This is, no doubt, due in part to the changes of plan already alluded to. The tramway at the first barrier has been useful. That at the second barrier has been very little used, and the wood-work of many bridges having been destroyed by jungle fires, the whole has been dismantled. Some of the materials, it is believed, will come into use in the navigation works.

19. This result of past expenditure is not encouraging. The work was hurried forward, in order to meet the interest felt by the English public, before the designs and estimates were fully matured or sufficiently considered; and the consequence no doubt is, that, to a great extent, the money hitherto spent upon the project has produced no adequate result. Thus, this instance is added to the many others which have come before the Government of India, of the necessity for insisting on the complete maturity and careful scrutiny of all projects of magnitude before the work is allowed to be put in hand.

20. The expenditure incurred has already amounted to 286,000 £, with as yet a comparatively small result; and, to complete the works to the extent contemplated, it is necessary to look forward to an outlay of at least 520,000 £ more. In all, the cost of the works will doubtless not be under 800,000 £, or four-fifths of a million sterling. It may come up to one million, or even to a million and a quarter, if unexpected difficulties are met with, and if prices continue to rise. And this is to afford, not the entire scheme for a permanent navigation all the year round, as was contemplated by the original projectors, but a river navigation of 309 miles from the sea, for four or five months of the year, supplemented by a road of 125 miles to Chanda, to connect the navigation with the roads of the Central Provinces, and bring it into contact with the Great Indian Peninsula Railway at about 60 miles from Chanda. The whole distance from the port of Coconada to the Great Indian Peninsula Railway will thus be 459 miles. The entire line of navigation which will be opened out by the works now contemplated from Ganapawaram, at the foot of the first barrier, to Dewalmurree, at the foot of the third barrier, is 186 miles; and the road to Chanda, 75 miles more, makes the line from end to end 261 miles; adding the 50 miles of road between Dewalmurree and Seroncha, the entire length of communication embraced in this project becomes 311 miles. The cost to the State will thus not be under 2,572 £. per mile; or looking to the additional sum now to be spent only (520,000 £.), it is 1,672 £. per mile. Or if it be thought more fair to calculate the cost upon the whole distance of the navigation from the sea to Dewalmurree (309 miles), the whole communication by navigation and road will come to 434 miles, and the cost from first to last, as estimated, will not be under 1,843 £. per mile, or the prospective outlay only not less than 1,198 £. per mile.

21. It thus appears that, on any calculation, the cost of the communication by the Godavery (even only the prospective cost) will exceed that of a metalled road for the entire distance, estimated according to the usual cost in the Central Provinces. But in this case, in order to make the comparison fair, it is necessary to take in the cost of the establishment to be employed in constructing the road, and to add something on account of the difficulty of the country. Taking the cost of the works only at 1,200 £. per mile as before, and adding as before one-third for the cost of the establishment, the charge would come up to 1,600 £. per mile; thus making the cost of the road more than the prospective outlay, according to the calculation of the last paragraph; but still not so much as in the calculation based on the distance actually to be opened out. Navigation is no doubt a superior mode of communication in many respects; but its superiority can hardly be considered so great as to make a navigation open for four or five months in the year better than a metalled road open during the entire twelve months.

22. If the calculation be made to take in the expenditure from the first, it is clear that the difference is very greatly against the navigation project; and had the cost of the whole project originally been understood to be as it now appears, it is probable that the work would never have been undertaken. Possibly it would never have been recommended by the projectors.

23. But taking the prospective outlay only, the probable cost, on the lowest estimate, is not above 1,200 £. a mile on the entire distance from the sea, and possibly the cost of a road might have been as high in such a locality. Certainly, with the cost of establishment added, it would exceed that sum—mounting up to 1,600 £. probably.

24. In this view, then, considering only the amount of the prospective outlay, the line of communication by the Godavery may not be thought so costly as to render it advisable to abandon the work. Although there is little apparent result from the large expenditure heretofore incurred, knowledge and experience have been gained, which may now be turned to account on the works. To abandon the works now would be to throw all this away, and to lose a considerable sum which may now be actually turned to account by completing the works. Thus it appears to the Governor General in Council possible that, upon the whole, Her Majesty's Government in England may deem that it will be best to prosecute the works to completion, on the scale recommended by Mr. Temple.

25. To carry out such a determination, there are two modes of procedure open to the Government. One is, to go on with the first barrier works until they are completed; and then, after that, to begin with the second barrier, and from thence with the road, until the communication at last shall be open from the sea to Chanda. But this mode of proceeding, though it would unquestionably be the safest, and would have other advantages, would be
very

very slow. The expenditure already incurred, and that to be incurred for several years to come, would remain unfruitful for a long period. Moreover, although the country is thinly peopled and poor, and great difficulties are experienced in getting labour, still the sites of the works are so far apart, the efforts to obtain labour would not greatly interfere with each other. The works, in fact, for the first barrier, second barrier, and Chanda road would to some extent draw upon separate labour markets for their supplies of workmen.

26. The Government of India will not in this place do more than record the circumstances, so far as now known, upon which an opinion may be based as to whether the works shall be proceeded with or not, or whether, if carried on, they shall be carried on over the whole line, or confined for the present to completing the first barrier works. The final decision on this point must rest with the Secretary of State, who will be addressed on the subject. And to aid in the decision, it seems desirable to obtain a report from engineers of reputation and experience, after an inspection of the work done, and of the site of the intended works. The Governments of Madras and Bombay will be asked to furnish officers to take part in this inquiry. But meanwhile it seems desirable to lay down the course of procedure that it may be advisable to adopt in case the ultimate determination should be to proceed with the works simultaneously to the full extent of Mr. Temple's proposals.

Grant of Funds for the Work.

27. In case it should be determined to proceed with the works, therefore, it is desirable to consider what would be the provision of funds necessary, in order to prosecute the works on the whole line of communication simultaneously. To do this with reasonable vigour a larger annual grant than 5½ lakhs (55,000 £.) should for the future be devoted to this object. Funds have to be provided to the extent, in all, of 465,000 £. Less than 90,000 £. per annum will not suffice to complete the works with a degree of rapidity that is reasonably requisite to bring into use the capital to be sunk in the construction. Perhaps more could not easily be spent with advantage in a poor and thinly-peopled country.

28. The grant for civil works in the Central Provinces was reduced with those for other administrations in the budget estimate for 1864-65, in order to allow of increased expenditure on providing improved accommodation for the troops throughout India; and it appears that the grant for civil works cannot be further cut down to provide more money for the Godavery works. It will be necessary, therefore, to provide an extra grant of 3½ lakhs (35,000 £.) for the Central Provinces for 1866-67, in order to the vigorous prosecution of the Godavery works, in case the Secretary of State for India should be disposed to sanction the prosecution of the works on the whole line, as here indicated.

This sum should provide for the steamers and plant required from England for the second barrier, as well as for commencing the works at site.

Establishments.

29. In regard to the projects and proposals now before the Government of India, it is to be observed that there is no estimate yet for the works between the second and third barriers which form part of the proposed series of works; nor is any estimate yet ready for the road to Chanda. The Chief Commissioner reported last January that the surveys for the latter work had been put in hand, and it is presumed that some progress has been made with them, and that, therefore, there would be no difficulty in speedily submitting matured projects for one or two sections of the road on which work might be begun at once, while the project for the remainder is being completed. The establishment under the Executive Engineer appointed to the road works must therefore include the means of carrying on the survey, as well as work of actual construction. And the establishment for the second barrier must in the same way include what is necessary to complete the project for the works between the second and third barriers.

30. In considering, then, the letters from the Chief Commissioner, No. 1479, dated 26th July 1864, and No. 3699, dated 14th October 1864, the Governor General in Council thinks it best at once to lay down the scale of establishment which would be suitable for carrying on the works, if the above scale of operations in regard to them should receive the approval of the Secretary of State for India. As the subject has received much consideration, it seems desirable to record the results arrived at now, so that there may be no further need for discussion and delay when the time for action arrives.

PAPERS RELATING TO THE

31. The following Table embodies the conclusions the Government of India have arrived at on this branch of the subject:—

TABLE of ESTABLISHMENT for carrying on the Works of the *Upper Godavery*.

	Superintending Engineer.	Executive Engineers.	Assistant Engineers.	Upper Subordinates.	Lower Subordinates.	Accountants.	Office Clerks.	Draftsmen.	Office Servants.	Cashiers and Storekeepers and Mohurras.	Marine Officers and Transport Agents.	Lascars and Petty Officers.	Medical Officers.	Native Doctors and Dressers.	Hospital Servants.
Superintending Engineer - - -	1	-	-	-	-	-	4	1	Rs. 25	-	-	-	-	-	-
First Barrier Division - - -	-	1	3	3	4	1	5	1	20	4	-	-	1	3	12
Second Barrier Division - - -	-	1	3	3	4	1	5	2	15	3	-	-	1	2	9
Road Division - - - -	-	1	3	3	4	1	5	2	15	3	-	-	-	2	4
Transport and Supply Agency - -	-	1	-	1	-	1	4	-	15	4	9	44	-	-	-
TOTAL - - - -	1	4	9	10	12	4	23	6	90	14	9	44	2	7	25
Approximate Monthly Cost - -	1,500	2,800	3,600	1,500	600	460	1,170	350	90	540	1,260	700	1,100	285	22
							<i>a.</i>	<i>b.</i>		<i>c.</i>	<i>d.</i>	<i>e.</i>	<i>f.</i>	<i>g.</i>	<i>h.</i>

Total per Mensem, Permanent Establishment - - - - - *Rs.* 16,175

Total per Annum, Permanent Establishment - - - - - *Rs.* 1,94,100

Add for Temporary Establishment, including Treasury Guards and Postal Peons - - - - - 11,490

Add for Travelling Allowances and Contingencies, at 10 per cent. on Permanent Establishment - - - - - 19,410

Grand Total per Annum, being equal to 25 per cent. of an outlay of nine lakhs annually - - - - - *Rs.* 2,25,000

<i>a.</i>	1 on 150 =	150
	2 on 70 =	140
	4 on 60 =	240
	5 on 50 =	250
	6 on 40 =	240
	5 on 30 =	150
	23 =	1,170

<i>b.</i>	1 on 80 =	80
	2 on 60 =	120
	3 on 50 =	150
	6 =	350

<i>c.</i>	1 on 80 =	80
	1 on 60 =	60
	2 on 50 =	100
	2 on 40 =	80
	4 on 30 =	120
	4 on 25 =	100
	14 =	540

<i>d.</i>	2 on 250 =	500
	1 on 200 =	200
	2 on 150 =	300
	1 on 100 =	100
	2 on 80 =	160
	8 =	1,260

<i>e.</i>	1 on 35 =	35
	9 on 25 =	225
	10 on 20 =	200
	24 on 10 =	240
	44 =	700

<i>f.</i>	1 on 600 =	600
	1 on 500 =	500
	2 =	1,100

<i>g.</i>	2 on 50 =	100
	2 on 40 =	80
	3 on 35 =	105
	7 =	285

<i>h.</i>	2 on 24 =	48
	11 on 8 =	88
	12 on 7 =	84
	25 =	220

32. This establishment would be required for the entire conduct of the works, and would be inclusive of what is already employed on the first barrier works. The addition to the provincial establishment of the Central Provinces, on orders being given to proceed with the entire series of works, would therefore be the difference between what is now employed on the Godavery works, and the scale above laid down.

33. The Superintending Engineer, whose services have lately been utilized for the general work of the Department in the Central Provinces, must, in case of the works of the Godavery being taken in hand on the scale above contemplated, be given up exclusively for the supervision of the works of the Godavery Circle; and other arrangements must be proposed for the works of the Nagpore Circle where he is now employed.

34. The Transport and Supply Agency has hitherto been maintained as a separate charge, to provide for the carriage of materials, and for procuring and distributing the food for the work-people, which has to be obtained from a distance. From the Chief Commissioner's Report on this subject, No. 7791A., dated the 18th March 1865, it seems clear that this agency must be kept up for the present, until it is certain that supplies will be procurable in the ordinary course of trade. The establishment should be reduced, as far as is consistent with

with the work to be done, and any of the boats not likely to be of use, should be sold or otherwise brought into use. The losses on the transport and supply transactions must be borne by the rates of the estimates, and should be charged off to the works accordingly.

35. Proceeding now to the matters more immediately connected with the works, the first barrier revised project is the first to be noticed.

1st Barrier Project.

36. The works at the first barrier were begun before the transfer of the projects to the Central Provinces Administration. The Madras Government intended at first to confine the operations to the tramways round all the barriers, having steamers to work between, and leaving the permanent works for after consideration. But on the suggestion of the Government of India in 1861,* the permanent works at the first barrier were allowed to go on, based on Captain Haig's first detailed estimate for an anicut and 25 miles of canal, amounting to 9,59,000 rupees (95,900 L.), and they have been in progress ever since.

37. In the course of the progress of the works and of the discussions which took place, it was found desirable to modify the project as regards the size of the locks and the site of the dam. It is not explained how much of the work first constructed has been thrown out of use. But the new project framed by Mr. Schmidt, the executive engineer under Captain Haig in 1863, does not include any of the works done prior to 1st May 1863. This project amounts to 35 lakhs (350,000 L.). It was submitted to the Chief Commissioner of the Central Provinces with Captain Haig's letter No. 333, dated 1st September 1863.

38. Captain Haig and Mr. Schmidt, however, differed in opinion as to the nature of the works required. The latter officer wished to pass all the drainage under the canal, while Captain Haig considered that it might with advantage and economy be passed through it. Captain Haig therefore sent up with Mr. Schmidt's project a rough estimate of the cost of carrying out his own views. The amount of this was 16,34,289 rupees (163,429 L.). The Chief Commissioner in his letter No. 1066, dated 15th October 1863, submitted these estimates to the Government of India, recommending sanction to be accorded to Captain Haig's. This letter, however, miscarried, and it was not until June 1864 that the papers reached the Government of India. Further information was then found necessary, and was obtained; and in October 1864, the matter was taken into consideration.

39. Captain Haig had meanwhile put in hand the preparation of a detailed estimate for his project, and the immediate submission of this was promised. It was, however, delayed, and Captain Haig having been obliged to proceed to England from ill-health, the estimate when prepared by Mr. Isaac, the executive engineer of the works, was submitted by Major Stoddard (Captain Haig's *locum tenens*). This estimate amounts to 17,08,963 rupees (170,896 L.), and was received with the Chief Commissioner's letter No. 442, dated 20th May 1865. Mr. Isaac agrees with Mr. Schmidt that the plan of passing the drainage through the canal is not advisable. Major Stoddard recommends certain alterations tending to reduce the cost of the works within Captain Haig's rough estimate of 16,34,287 rupees (163,429 L.). These modifications are approved; but as some enhancement of rates is to be apprehended, the project will in this resolution be treated as from Mr. Isaac's figures.

40. In the meantime, in a letter No. 616, dated 16th November 1863 (Public Works Proceedings, July 1864, No. 17), and subsequently in No. 1236, dated 26th April 1864, forwarded with the Chief Commissioner's No. 909, dated 24th June 1864, Captain Haig urged the advantage of postponing, for the present, the execution of the work on twenty-two miles of the canal, being satisfied to connect the water above the anicut with that below, by a short canal with barge locks at its tail, which he states would be sufficient to maintain the navigation for four months of the year for steamers, and for six or eight months for boats. The cost of the lock would not exceed 20,000 rupees (2,000 L.), and of the blasting operations necessary to render navigable the main channel in the portion of the barrier below, would come to 15,000 rupees (1,500 L.). Three times that sum would make the navigation in this lower part of the barrier practicable for steamers. The entire cost of the additional work required was not stated; and, though urged by the Chief Commissioner to prepare a detailed design and estimate, Captain Haig had not done so.

41. This modification of the project, if the lock and connecting channel be made fit for the navigation of steamers, precisely suits the views of the Government of India, of affording a communication by steamers for four or five months of the year; and the Chief Commissioner will accordingly be directed to cause a detailed design and estimate to be prepared, and the works to be put in hand accordingly as soon as it has been approved. All further works on such parts of the canal which will not come into use under this arrangement, will at once be stopped.

42. It thus becomes unnecessary to discuss the doubtful points respecting drainage in the project for the lower canal. All other parts of the first barrier project are approved and sanctioned provisionally, subject to the decision of the Secretary of State as to proceeding with the works.

43. The

* Papers ordered by House of Commons to be printed, 18th February 1862, page 134, Letter No. 2407, dated 6th July 1861.

43. The financial effect of the sanction proposed cannot be precisely stated until the detailed estimate for the shorter canal is received; but it may be approximately estimated. And in order to state the more accurately the amount for which sanction is required, it will be necessary to take into account the increase of rates on masonry works, which, from the last half-yearly progress report, it appears is likely to come to as much as 30 per cent.

	<i>Rs.</i>	<i>Rs.</i>
<i>Anicut</i> —Masonry - - - - -	2,02,013	
30 per cent. - - - - -	60,604	
Other works - - - - -	49,005	
		3,11,622
<i>Scouring Sluices</i> —Masonry - - - - -	52,695	
30 per cent. - - - - -	15,808	
Other works - - - - -	15,737	
		84,240
<i>Head Lock</i> —Masonry - - - - -	67,499	
30 per cent. - - - - -	20,250	
Other works - - - - -	25,553	
		1,13,302
<i>Short Canal</i> with its lock, say, including the blasting operation to open the channel below - - - - -	- - -	2,50,000
Accommodation for establishment and shelter for stores - - - - -	- - -	80,000
		8,39,164
Add contingencies at 5 per cent. - - - - -	- - -	41,958
Add total cost of work done on canal from 1st May 1863 to May 1865 - - - - -	- - -	1,63,245
TOTAL Cost of Work to be sanctioned - - -	<i>Rs.</i>	10,44,367

44. Of this amount, 4,47,108 rupees has already been spent on work actually executed, and 5,97,259 rupees remains to be spent. But there is a considerable stock of materials already laid in, so that probably the cash outlay yet required will not exceed four lakhs, exclusive of establishments. This latter may be reckoned at one and a half lakhs more.

45. Thus it would seem that the money provided in the budget for 1865-66 ought to complete the work at the first barrier, as now limited; but this is not probable. The difficulties in procuring labour, especially after the late lamentable outbreak of cholera, will doubtless prolong the period for completing the works. A portion of the funds of 1855-56 may therefore be available for the purchase of the steamers and flats from England for the second barrier works, as mentioned more in detail below.

46. The Chief Commissioner has already given sanction, as reported in his letter, No. 2860, dated 15th September 1864 (para. 6), to blasting operations, at a cost not exceeding 10,000 rupees, between the first and second barriers. This is approved by the Government of India.

Second Barrier Project.

47. This has been received with the Chief Commissioner's letter, No. 996 A., dated 4th July 1864. The project consists simply of a dam of large blocks of rough stone across the river, with scouring sluices, and a series of locks on one side. There is no canal. The amount of the estimate is 11,34,139 rupees; but from experience of the first barrier works, there is every prospect that there will be a rise of the rates at the second barrier also, so that the cost of the rubble and cut-stone masonry will exceed the estimate by nearly 50 per cent. But this rise will probably not affect the main item of rough-stone work, so that on the whole the estimate may not be largely exceeded.

The main items are—

	<i>Rs.</i>
Locks - - - - -	1,78,021
Guard sluice and wing walls - - - - -	1,36,442
TOTAL Masonry Works - - -	3,14,463
Anicut or dam of rough stone - - - - -	6,77,251
Navigable channel below - - - - -	40,768
Shelter for establishment and stores - - - - -	47,650
	10,80,132
Contingencies at 5 per cent. - - - - -	54,007
TOTAL - - - <i>Rs.</i>	11,34,139

Allowing

Allowing for the rise of rates above anticipated, the work is not likely to be completed for less than 13 lakhs of rupees.

48. It is observed that Captain Haig, after proposing and examining several projects, at length reverts to his original plan of a simple dam with locks. The general design of the works is approved as suitable and good. But possibly the dam itself may admit of some reduction in dimensions, while the wing and guard walls would, it appears, be better if rendered more lofty and massive, so as to be safer from injury and afford better protection from the floods. The dimensions of the locks must be made 200 × 30 feet. The inner lock walls may perhaps be dispensed with if the bank is hard and solid. There would appear to be a want of depth in the chamber of the lowest lock; and it might be well to have valves to the lock gates as well as in the walls. The separate wing wall to the entrance of the upper lock may perhaps be omitted with advantage, joining the lock with a curve to the guard wall of the sluices. These are the only points in the design that seem to call for further consideration.

49. The supplementary estimate, amounting to 47,650 rupees, for shelter for establishments and stores, is sanctioned provisionally to cover the expenditure on the work which has taken place, in order to provide the shelter for the establishment required for preliminary operations. No further expenditure is to be incurred without orders.

50. In a letter, No. 2860, dated 15th September 1864, the Chief Commissioner forwards certain proposals of Captain Haig's connected with the progress of the works of the second barrier.

These are—

I.—To procure from England—

450 Tons of Iron Rails;	1 Portable Engine;
6 Turn Tables;	4 Mortar Mills;
10 Cranes and Chains;	4 Puz Mills;
3 Small Locomotive Engines;	Corrugated Iron;
60 Sets of iron works for Trucks;	Patent Forge.

These will probably cost 10,000 £.

II.—To order in England—

- 2 Steamers of iron, 150 × 25 feet;
- 2 Barges of ditto - - ditto;
- 2 Engines 16-horse power, to replace those worn out of one of the existing steamers.

The cost of these is set down at 15,500 £; but probably the cost, landed at Coconada, will come to 20,000 £.

III.—To procure from England the services of a practical quarry superintendent, to be graded as a sub-engineer in the Public Works Department.

IV.—To obtain, from the Madras Government, the services of a company of sappers, and to build lines for them at the second barrier works.

51. The first three of these proposals will be referred to the Secretary of State for favourable consideration and orders, with the remark that the rails should perhaps be lighter than 48 lbs. per yard; and that the steamers and barges should be built fully up to the size of locks, which has been fixed by the Government of India at 200 × 30 feet.

52. Some of the articles, and even the steamers, might perhaps be procured in Calcutta from the surplus railway stores; but there would be difficulty in arranging to transport them to Coconada, and after all they might not be so suitable as they would be if procured under Captain Haig's own orders in England, and shipped direct to the mouth of the Godavery.

53. The charge for these things will probably come to three lakhs, and must be met from the budget grants for 1865-66 and 1866-67. It is understood that the cost of these things will, for the most part, be repaid in the savings they will effect on the cost of the works, and that little or no extra charge will then be incurred beyond the 13 lakhs above stated.

Concluding Remarks.

54. Some concluding remarks are necessary on the manner in which these projects have been prepared. It was, as already stated in this resolution, laid down by the Government of India that the scheme to be adopted was one for a water communication to the foot of the third barrier, with a road from thence to Chanda; the water communication was to be open only for four or five months during the year, and the road to be such as to be open for traffic during the rainy season when the river could be made use of under this scheme.

55. In working up a project to carry out these instructions, it was naturally to be expected that these orders would have been referred to, and that the engineer's reports

would have shown that the works devised were such as were necessary, and no more than necessary, for carrying out the object the Government had in view. And further, it was to be expected that if the entire project could not be submitted as a whole, that at least there would have been some account of the wanting parts, and some rough statement of their probable cost, so that it might be known how each partial project stood related to the whole. But nothing of this sort has been given.

56. In the first barrier project there is nothing to show that an anicut or dam was necessary at all for the duration of the navigation contemplated by the Government of India; and it is clear that the length of canal contained in the projects of October 1863 and May 1865, was not required, had the conditions specified by the Government of India been attended to, since it has now been proposed to suspend its construction, and to use a shorter canal which it is said will afford navigation for the period specified. If Captain Haig hoped to induce the Government of India to extend the project to a navigation for the entire season and estimated accordingly, he should at least have estimated also upon the general scheme which had been laid down for his guidance.

57. Again, in regard to the second barrier project, it has been left for the Government of India to discover whether the works are meant to afford navigation for the entire year or for four or five months, and it is not quite clear that some less height of anicut might not suffice for the latter.

58. Further, no information is given of the state of the river below the first barrier, whether it gives now a sufficient depth of water for navigation to the extent contemplated by the Government of India, or whether any further clearances are necessary.

59. In regard to the river between the first and second barriers, it is said that certain clearances involving an expenditure of 10,000 rupees are necessary to remove obstructions, and it is stated that the work contemplated will open the river for navigation for six months of the year. It should have been stated definitely that it is believed that no further work will be necessary to place the river in completely satisfactory condition, or what further expenditure is expected to be required.

60. Above the second barrier, again, to the foot of the third, no information is given of the state of the river. If it is the case that time has not permitted any further investigation to be made, and that the sum set down in Mr. Temple's report is still supposed to be a fair estimate of the expenditure to be incurred, this ought to have been stated. As it is, the Government of India are left to assume that this is the case.

61. Once more, no estimate or rough calculation of the cost of the road is given, and the Government of India is left to frame one for itself, without the assistance of the local knowledge of the officers employed upon the works.

62. No doubt, information on all these points, of more or less precise nature, and of more or less recent date, is to be found by searching through all the reports that have been submitted on the subject of the Godavery navigation. But the opinions and information on these subjects have varied much since the works were first contemplated; and on the occasion of the submission of the partial projects now before the Government of India, it is clearly proper that a résumé should have been given, stating clearly the state of the information available, and the last opinion formed on each point in question.

63. The Governor General in Council fully appreciates the zeal and ability with which Captain Haig has investigated the project for the navigation of the Godavery, and the difficulties and hardships he has encountered in this pursuit. All his letters show how much he has this object at heart, and how the interest he feels induces him to urge forward the prosecution of the works according to his latest views and opinions. Feeling thus, it is with regret that the Governor General in Council finds it necessary to remark that the settlement of the question of proceeding with the works for navigation on the Upper Godavery has been rendered difficult, and much retarded, by the want of concise, definite, and systematic information.

The provisional sanctions accorded in the above resolution have been entered as Nos. 63 and 64 of 1865-66 in the register of this office.

ORDER.—Ordered that a copy of the foregoing observations be forwarded to the Chief Commissioner of the Central Provinces, for information and guidance.

Ordered also, that a copy of the foregoing observations be forwarded to the Financial Department for information, with intimation that it is not necessarily implied that an extra grant for public works of improvement will be required for 1866-67, in order to carry on these works. It may be arranged within the present total sum allowed for India; but this will be considered with other wants in communication with the Financial Department on the subject of the general grant of funds for public works for 1866-67.

Ordered further, that a copy of the foregoing observations be forwarded to the Govern-
ments

ments of Madras and Bombay, with reference to paragraph 26, with a letter asking for the services of an experienced officer for each presidency to report on the subject.

Ordered finally, that the Secretary of State be addressed with the view of obtaining orders on the subject of continuing the works, and if so decided, to authorise Captain Haig to procure the supplies from England accordingly.

(signed) C. H. Dickens, Lieut.-Col., R. A.
Secretary to the Government of India, P. W. D.

— No. 9. —

PUBLIC WORKS DESPATCH to the Government of *India* (No. 11),
dated 8th February 1866.

Para. 1. THE review of past, and the discussion as to future, procedure in the matter of the Godavery Navigation Works, contained in the papers transmitted with your Excellency's Despatches, Nos. 90 and 116, of 9th August and 13th September last, have caused me again to consider the whole subject in Council, and I have taken advantage of Major Haig's presence in this country to confer with him on the project, with the details of which he has so long been personally connected.

2. There seem to me good grounds for believing that, if brought into navigable condition, the Godavery and its affluents will afford the cheapest possible means of transport for the whole territory through which they run; that the greater part of that territory is quite beyond the reach of any existing or projected railways; and that even from those districts of Nagpore which may become accessible both by river and railway, the latter will not suffice to carry down to the coast more than a portion of the cotton and other produce likely to be raised for exportation. Indeed, from information which has lately reached me, the requirements of traffic are already greater than can be met by a railway up to the point which the one under construction has hitherto reached, although that point is still distant from those districts of the Nagpore territory for whose staple products a new outlet is most needed.

3. With respect to the limits to be set to the Godavery project, the advantages which may be derived from it cannot be properly developed unless the navigation be extended considerably beyond the third barrier. Between that barrier and Rajahmundry the country on both sides is represented as being for the most part uncultivated forest, and although the improvement of those tracts might, doubtless, be greatly accelerated by the opening of the river, still that result would at best be only a very inadequate as well as very remote return for the large expenditure demanded for the latter purpose. In order to secure those more important and more immediate advantages with a view to which the project was originally undertaken, navigation must, in my opinion, be made to commence at the nearest practicable point to the great cotton fields of Nagpore, and that point is represented to be Hinghinghat. It has been roughly estimated by Major Haig that to establish a continuous line of water communication from Hinghinghat downwards would require a total outlay of 800,000 £., or about 538,000 £. beyond what has already been spent, and although this sum very considerably exceeds the original estimate, it would still appear to be not too high a price to pay for between four and five hundred miles of river navigation, open during the greater part of the year.

4. With respect to the works at the first and second barriers, and indeed up to the foot of the third, I entirely concur in the conclusion at which you have arrived, that, having proceeded so far, these works must be prosecuted to completion, and that the sooner they are finished the better. For the third barrier,

however, no detailed plans or estimates have yet been prepared, and these must be got ready before any work is permitted to commence at that barrier, for past experience has shown too clearly the evil consequences of proceeding without those essential preliminaries to allow of their being again dispensed with.

5. Still higher up the stream, the portion between Chanda and Hinghinghat has not yet been properly examined, and careful surveys must be made before trustworthy plans or estimates of the operations there required can be framed. Those surveys should be set on foot without delay, and pushed forward vigorously while the works at the lower barriers are in course of execution.

6. To complete the communication with the Nagpore country, you have proposed the construction of a road, but I am of opinion that water communication, if attainable at a reasonable expense, would be far preferable, and if navigation can be extended as far as Hinghinghat, or even as Chanda, the proposed road from the latter place to the foot of the third barrier would apparently be superfluous. The cost of that road, exclusive of a bridge over the Wurdah, is roughly estimated at 75,000 *l.*, but it is doubtful whether sufficient allowance has been made for difficulties of construction, and the real cost might, not improbably, be much greater. So large an outlay ought not to be incurred when there is a great probability of a more complete means of communication being made. The data for comparing the cost and advantages of the alternative modes of transport are not yet in your possession, and should be obtained as soon as possible, but in the meantime all operations on the proposed road, if any have been already begun, should, it appears to me, be suspended, and all sanctions given in connection with it should be held in abeyance.

7. In accordance with the suggestion made in the 19th paragraph of your Despatch, of 13th September last, Major Haig will be at once employed in procuring the steamer, plant, &c., required for the operations at the second barrier.

8. If it should be determined to construct a canal on the right bank of the river, near the third barrier, I must not omit to draw your Excellency's attention to the necessity of obtaining from the Nizam the cession of that portion of territory through which the canal would be cut, and early arrangements should evidently be made for the purpose.

9. I do not wish to be understood as enjoining the construction of the works referred to above, but I desire that the arguments in their favour may be duly weighed by your Government, with whom will rest the responsibility of providing the requisite means for their execution. With the foregoing expression of my views, and with the reports of those engineers of reputation and hydraulic experience whom, as the later of your Despatches under reply informs me, you were about to depute to examine the river, you will, I trust, have no difficulty in deciding on the course to be henceforward pursued with respect to the Godavery works, so that no further delay may occur in the prosecution of an undertaking which, if satisfactorily concluded, promises to prove highly conducive to the interests of this country as well as of India.

10. Major Haig has submitted to me a memorandum on the Godavery works generally, copy of which is forwarded herewith for your information.

(signed) *C. Wood.*

Enclosure 1, in No. 9.

MEMORANDUM on the NAVIGATION of the RIVER GODAVERY, by Captain
F. T. Haig, Royal Engineers.

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MEMORANDUM of the NAVIGATION of the RIVER GODAVERY.

1. THE Despatch of the Government of India to the Right Honourable the Secretary of State for India, under date 13th September 1865, having called in question the policy of proceeding with the works now in progress on the Godavery, it is desirable that the whole question should now be reviewed, with the aid of all the information upon the subject which has been obtained in the course of the last 10 years.

In the following paper, therefore, the question will be considered with reference to the capabilities of the river for navigation; the probable cost of opening it up to a greater or less distance from the sea; the present condition in regard to population, trade, and revenue of its valley; and the probable effect of the opening of the river upon the country.

A brief sketch of the history of the project, and of the progress of the works up to the present time, will also be given. The evidence which will be brought forward upon such of the above points as do not involve questions of a purely engineering character will be derived chiefly from the published reports of the Chief Commissioner, Central Provinces, statistical reports to the Resident at Hyderabad, and other public documents, the source from whence the information is obtained being in each case noted in the margin. With regard to the engineering parts of the subject, the facts which may be adduced, and the opinions expressed, will be supported by references to reports submitted to the Governments of Madras and of India.

2. Reference may first be made to the map which accompanies, and which has been prepared in such a manner as to convey, as far as possible, to the eye, correct ideas as to the general extent, territorial limits, and population, of the part of Central India interested in the Godavery scheme.

This map comprises that portion of Central India which is situated between the parallels of 22° 9' N. and 16° N., and bounded on the other two sides by the two seas. It is tinted with two colours only: red, representing British territory, and green, that of the Nizam; and the different shades of intensity given to these colours are intended to show different densities of population.

In the centre of each of such of the tracts thus indicated as have a special bearing upon the subject under discussion is noted its area in square miles, its population, and principal productions.

3. It will be observed that the centre of the map, comprising the valley of the Godavery, is occupied by that river and its numerous tributaries, which extend their ramifications throughout an area of 120,000 square miles (about three times the size of Ireland), and the broad blue line which, starting from a point a little to the south-west of Nagpore,

runs in a south-easterly direction to the sea, is that part of the Godavery, and its tributary the Wurda, which it is proposed to render navigable. The Mahanuddy is seen flowing to the north-east, to the Bay of Bengal, near Cuttack; the Taptee to the west, down the Valley of Berar; while on the south the Kistna, descending from the west, falls into the Bay of Bengal, near Masulipatam.

The principal mountain ranges are (1) the Western Ghauts, where the Godavery proper takes its rise; (2), the Eastern Ghauts, through which the Godavery passes, about 60 miles from the sea; (3), the Santpoora Range, running east and west, the source of the two northern tributaries of the Godavery; and (4), the lower range of hills which bounds the Valley of Berar on the south.

In the upper centre of the map stands Nagpore, distant, by the railway now under construction, 528 miles from Bombay, and by road (to Hingenghat) and river, 515 miles from Cocanada, the port of the Godavery.

4. Directing our attention now to the Valley of the Godavery, we notice, in the first place, that that part of the river which it is proposed to navigate, forms the dividing line between the British and the Nizam's territories. *All the British possessions interested in the opening of the river lie exclusively on the north bank; those of the Nizam occupy the southern.*

Turning, first, to the former, we find them represented in the map under the following divisions, distinguished according to relative density of population by different degrees of colour.

	Area.	Population.	
	<i>Square miles.</i>		
Valley of Nagpore - - -	23,000	3,140,000	Mr. Temple's Report of 23rd January 1863.
Bustar Territories - - -	13,000	200,000	
Godavery District * - -	3,900	54,300	

Bustar is a semi-independent State, a dependency of Nagpoor.

The Godavery districts comprise the narrow strip down the left bank of the river which was ceded to us by the Nizam in 1860, and must not be confounded with the "Godavery district" on the coast.

To the north of Bustar, again, we have Chutteesghur, with a population of 1,500,000, covering an area of 35,000 square miles. This province lies almost wholly outside of the Godavery Valley, but will, nevertheless, as regards its southern portion, at least, benefit considerably by the opening of the river.

5. The statistics in regard to revenue, productions, &c., of these four great divisions are given, as follows, by Mr. Temple:

VALLEY of NAGPOOR.†

Population, 3,140,000.

Revenue, 289,200 £ (in 1863).

Well cultivated throughout.

Tank irrigation in southern part.

Productions.—Cotton, wheat, maize, millet, oil-seeds, rice, hemp, &c.

Cotton is grown over a tract extending from the hills west of Nagpoor down 150 miles of the Wurda, to the third barrier. Crop estimated at 30,000,000 lbs.

The culturable area of this valley is stated to be for the most part occupied.

* Mr. Temple gives the population of six out of eight districts, included in this tract, at 17 to the square mile. That of the whole eight is here calculated at this rate.

† "Below the hills the valley is broad, generally cultivated, and often rich. On the right bank, opposite Nagpoor itself, the valley reaches to a breadth of some 40 miles of unbroken cultivation, till it is separated by low hills and uplands from the valley of the Wurda. Further down, southwards, the valley of the Wynegunga becomes narrower; these lowlands are cultivated, and irrigation from tanks is abundant, but the climate in the neighbourhood is very insalubrious. In the upper portion the cultivation consists of wheat, maize, millet, and oil-seeds; in the lower portion it consists mainly of rice.

"As regards the second of the two divisions, it is to be observed that the Wurda river debouches from the Santpoora Range, to the north-west of Nagpoor. It is along the left bank of the river that is situated the great cotton field of Nagpoor. Immediately below the range, the cultivation consists of a narrow strip of land along the foot of hilly uplands. This strip widens as it proceeds southwards, till it attains a width of from 40 to 50 miles, at a point which may be marked by Hingunghat, the cotton mart. Below this the country becomes narrower, till the city of Chanda is reached. Below Chanda, again, it becomes contracted to a mere strip of culture along the river bank. Beyond the limits of cultivation, that is, to the eastward, there commences an extent of undulating rough ground of light inferior soil, covered with low forest, and generally supposed to be not worth cultivating. But within the limits of cultivation the ground is fully occupied

CHUTTEESGHUR DISTRICT.*

Population, 1,500,000.

Productions.—Cotton, lac, ghee (clarified butter), wheat, gram, rice, linseed, oil-seeds, and hemp. Cotton cultivation of recent date, and rapidly extending. Crop of 1863 estimated at 36,750,000 lbs.

Cultivated area, 3,200,000 acres.

occupied right up to the river. The soil is a black rich loam. The cultivation consists partly of cotton, and partly of wheat, millet, oil-seeds, and hemp.

	EXPORTS.	Maunds.	Value.	IMPORTS.	Maunds.	Value.
			<i>Rs.</i>			<i>Rs.</i>
Trade with Bombay.	Cotton - - -	85,000	13,00,000	Salt - - -	200,000	10,00,000
	Linseed - - -	100,000	2,50,000	European piece-goods -	-	7,00,000
	Gingelly - - -	50,000	1,50,000	Bullion { Silver -	-	5,00,000
	Horns - - -	-	5,000	{ Gold - -	-	10,00,000
	Hides (latterly only) -	-	5,000	Silk - - -	1,200	1,00,000
	Ghee, or clarified butter	10,000	1,50,000	European stores -	7,000	2,00,000
	Red ochre - - -	3,000	5,000	Articles of hardware,	5,000	1,00,000
	Coarse cloth - - -	-	10,00,000	brass and copper vessels.	-	-
				Dyes - - -	1,000	50,000
				Miscellaneous - - -	35,000	2,00,000
Trade with Calcutta.	Hides - - -	-	50,000	Bullion { Silver -	-	-
				{ Gold - -	-	5,00,000
				Sugar - - -	20,000	3,50,000
				Articles of hardware,	5,000	20,000
				brass and copper vessels, &c.	-	-
				Silk - - -	4,000	3,00,000
				European piece-goods -	-	4,00,000
				Miscellaneous - - -	5,000	25,000
Trade with Eastern Coast.	- - -	-	-	Military stores, about	-	-
				500 tons.	-	-
				Tobacco and cloth -	-	30,000
				Cocoanuts - - -	-	1,00,000
	TOTAL EXPORTS - - -	<i>Rs.</i>	29,15,000	TOTAL IMPORTS - - -	<i>Rs.</i>	55,75,000

* “ This tract produces excellent rice and wheat, oil-seeds, and fibres. Of late years the culture of cotton has been commenced, and has increased so rapidly that already the crop is estimated at 36,750,000 lbs. per annum. It is generally anticipated that, as communications are opened, the culture of cotton will be indefinitely extended. Lac is obtained in quantities from the neighbouring jungle. So superabundant is agricultural produce beyond the demand of consumption on the spot, that prices of grain are often three times as cheap in Chutteesghur as elsewhere, and sometimes the disproportion has even been greater. The excessive cheapness of food has the usual effect on the character of the people, rendering them indolent and improvident; so that there is reason to hope that, if their energy were aroused by adequate inducements, a far greater quantity of produce might be raised by them than at present. And evidently this cheapness must afford an extraordinary inducement to exportation, if means or opportunities of exportation were presented.

	EXPORTS.	Maunds.	Value.	IMPORTS.	Maunds.	Value.
			<i>Rs.</i>			<i>Rs.</i>
Trade with Nagpore.	Wheat - - -	300,000	4,50,000	European piece goods -	-	50,000
	Gram - - -	150,000	2,50,000	Bullion { Silver -	-	1,00,000
	Rice - - -	150,000	2,50,000		-	4,00,000
	Toor - - -	10,000	15,000	Miscellaneous -	-	25,000
	Linseed - - -	10,000	25,000		5,000	-
	Oil - - -	10,000	50,000			
	Gingelly - - -	5,000	15,000			
	Dyes - - -	2,000	8,000			
	Cocoanuts, bullock loads	4,000	1,00,000			
	Miscellaneous - - -	5,000	25,000			
Trade with Mirzapore and Calcutta.	Wheat - - -	20,000	30,000	Brass and copper vessels	2,500	50,000
	Lac - - -	20,000	1,50,000	European piece-goods -	-	25,000
	Hemp - - -	5,000	10,000	Miscellaneous -	-	25,000
	Ghee (clarified butter)	1,200	25,000		5,000	-
	Coarse cloth - - -	-	10,000			
	Cotton - - -	-	3,00,000			
Trade with Cuttack.	- - -	-	-	Cocoanuts, bullock loads	4,500	1,20,000
Trade with Ganjam.	- - -	-	-	Salt - - -	75,000	4,00,000
	TOTAL EXPORTS - - -	<i>Rs.</i>	17,11,000	TOTAL IMPORTS - - -	<i>Rs.</i>	11,95,000

BUSTAR STATE.*

Population roughly estimated at 200,000.

Revenue about 10,000 *l*.

Thinly populated. Cultivation scanty. Mostly a forest country, containing some valuable timber, and producing the ordinary cereals.

GODAVERY DISTRICTS.†

Extend along 250 miles of the river.

Population scanty; about 17 per square mile. Total, 54,000.

Cultivated area, 60,000 acres.

Culturable area, 670,000 acres.

Highly improvable. Has numerous old tanks, bearing the traces of a formerly much more highly cultivated and prosperous condition.

Became British territory in 1860.

Productions.—Wheat in small quantities; a crop first introduced about eight years ago, and now extending down fully 100 miles of the river on both banks. Cotton in small quantities. Millet, rice, oil-seeds, pulses, plantains (bananas), limes, oranges.

Pasturage excellent and in unlimited abundance. These districts abound in cattle and sheep, exporting hides, wool, and ghee.

Forest products: Teak and other timbers of small size; the Ahiree forests estimated to contain 15,000 serviceable logs of teak; wax, galls.

6. Turning next to the south side of the river we find it wholly occupied by the Nizam's dominions, including the valley of Berar (distinguished by a deeper tint of green), which however, is now assigned to the British Government and under British management.

About

* "It lies immediately to the north of the valley of the Godavery; its area is very great, and has been estimated at as high as 13,000 square miles. It is hilly, for the most part covered with forest and jungle, everywhere wild, and in some parts even barbarous. Its population and its cultivation are very scanty. The population is believed not to exceed 200,000 souls; its revenues may amount to a lakh of rupees per annum. It has some valuable forests, which will be alluded to hereafter, and one route for traders from Chutteesghur, which has been already alluded to. It produces the ordinary cereals, and could, of course, produce much more. It will improve as its communications with Chutteesghur on the north, and the Godavery on the south, shall be opened. But some time must elapse before this territory could contribute any important quota to the general trade.

"The Ahiree teak forests have been already mentioned in paragraph 68. They are estimated to contain 15,000 serviceable logs. The other teak forests of the Godavery are situated chiefly in the Bustar territories beyond our regular civil jurisdiction. The principal are those of the Kotapilly subdivision, from which the timber is floated down the River Tal to the Godavery; and those of the Byjee and Soonkoom subdivisions; also the Mukanagiri subdivisions of Jeypoor; from all which the timber is floated down the Sibbree. These have been noble forests, but are now no longer so, owing to unchecked expenditure. These are the forests which the native government leased out to contractors, without any stipulation regarding conservancy, and from which the great cantonment of Secunderabad and buildings of all kinds at Hyderabad have been built for many years. As the teak logs float extremely well, the Godavery has always been largely made use of to convey them towards the coast. In 1860-1 no less than 25,000 logs were thus floated down, and this traffic still continues, though under better regulations than heretofore. A large portion of the timber cut in former years has consisted of undersized logs, obtained from trees felled before arriving at mature growth. This reckless destruction, for temporary advantage, of trees which, if spared, might double in value, has seriously diminished the timber resources of the Godavery. Vigorous measures are now taken for conservation. Undersized logs, cut after a certain date, are stopped on the river; and the Bustar authorities are urged, for their own sake, as well as for the common weal, to co-operate in the conservancy. Thus these first-class forests may have a chance of reproducing themselves; and the next generation, enjoying the fruit of our present labours, may see a never-failing supply of first-rate teak timber floating down the great river. First-class teak forests were reported by Captain Stuart, the superintendent of forests, to exist in the higher hills near the Indrawutty. But it is doubtful whether this timber will be made available on account of this distance from the Indrawutty, and of the difficult, if not impracticable, character of the river itself."—Mr. TEMPLE'S Report.

† "So far as extent of land is concerned, a fine field is open for agricultural enterprise, inasmuch as it will be seen that, while 60,608 acres, or about 95 square miles only, are as yet cultivated, there are estimated to be culturable and available 261,600 acres of the better sort, and 428,854 of the second sort; in all, 670,454 acres. If in future times the whole of this were to be cultivated, the agricultural production of the country would be increased by 30 or 40 lakhs per annum, the worth of produce by the lowest calculation. If only half were cultivated, there would still be an addition of 15 or 20 lakhs a year to the gross produce.

"The cultivated area, now so deficient, was at one period larger than at present; and the country more prosperous. In the jungle there are remains of the earthwork of tanks supposed to be a century or so old, and now quite overgrown with brushwood. There are, also, remains of tanks in many villages which may now be improved.

"The present products are wheat (in places only); cotton in very small quantities; millet (jowaree) of fair quality; rice, good; oil-seeds, inferior; castor-oil; pulses; a few common vegetables; plantain trees, coarse; limes and oranges small. In one village only is sugar cane-produced. Neither the cocoanut tree nor the date palm are to be found; but the palmyra or toddy palm, and the mohwa tree are both in fair abundance; they are both used for liquor, to which the people are much addicted. The staples which supply the food of the people are millet and rice. They do eat meat to a certain extent, such as mutton and poultry. The Gonds eat the flesh of the buffalo and even of the cow, and many of them live on game. The buffaloes are large and fat; the cows though good, are of a small breed; the bullocks are small but hardy; the sheep are also small, but good; the goats are good also. The pasturage is everywhere excellent, and the cattle are in the best possible condition. As might be expected, ghee (clarified butter), hides, and wool, are abundant. All three articles are largely exported to the Deccan and elsewhere by land as yet; wax and galls are produced, but lac is not (as might have been otherwise supposed) produced in these jungles."—Mr. TEMPLE'S Report.

About half the valley of the Godavery lies on this side of the river. It includes in fact the drainage basin of the main Godavery. With the improvement and utilization of this river we are not now concerned. Only a part, therefore, of its valley will contribute to the traffic of that part of the Godavery and Wurda whose improvement is now contemplated.

The probable limits of this tract are shown approximately by the heavy dotted line which, starting from the river where it passes through the Eastern Ghauts, runs first in a westerly direction a little to the north of Hyderabad, and then, turning to the north-west, crosses the main Godavery at the junction of the Munjera, and closes on the hills which bound the valley of Berar on the south.

7. The statistics of this part of the Nizam's dominions, covering as it does an area of 30,850 square miles, cannot be given in the same completeness, or with the same confidence as to their accuracy, as those for the British Possessions on the north bank.

It is, however fairly populated. It includes the Warungul country, which it is evident, from the astonishing number of tanks which cover it, was formerly highly cultivated and populous, but is now, through neglect and misgovernment, in much the same condition as the surrounding country. The population of the whole tract south of Berar may be taken approximately at 50 to the square mile; that of Berar at 70; which would give a total of 2,177,000. Its productions are various. In the upper part, viz., that to the north of the Godavery, cotton and wheat are extensively grown, and everywhere the other cereals, as pulses, millet, and rice, are to be met with, as well as hemp, and the other products mentioned as common in the British territories on the north bank. Woony and Jennagaum, on the right bank of the Wurda, the one a few miles above Chanda, and the other 40 miles below it, are well-known cotton marts, though not at all comparable in point of size and trade with such towns as Hingenghat on the other side of the river.*

8. To the north of the Nizam's provinces above described lies the valley of Berar, the great cotton field of Central India.

A line of navigation connecting it with the river may, undoubtedly, be carried into the heart of it, and this rich province may, and doubtless will ultimately, contribute to the river traffic. Its position in close proximity to the river, though outside † of the valley of Wurda, may here be noted.

Its resources and importance are too well known to call for any particular description. The railway runs through its centre.

9. We have now taken a general survey of the whole of that part of the Godavery valley, both north and south of the part of the river which it is proposed to navigate, likely to benefit in a greater or less degree by the opening of this new communication.

It forms what may be termed the natural trade basin of the river, though viewed in this aspect its limits will not follow precisely those above laid down, but may be more or less expanded or contracted according to the degree of development given to the various feeding lines which must connect its remoter portions with the river.

Viewing it then as a whole, the following are seen to be its most prominent characteristics:

1st. That the whole valley on the north of the river is British territory; all that to the south belongs to the Nizam.‡

2nd. That in respect of natural resources the whole valley possesses abundantly the elements of wealth likely to develop, in British territory, into a high degree of prosperity, leading sooner or later to an extensive and flourishing trade, if only the means of cheap export and import are provided.

3rd. That in respect of population and production the upper part of the valley, viz., that lying above the third barrier, is much the most important; its population being half that of the whole of the rest of the valley.

4th. That, as a consequence, it is from this part of the valley that the most important and immediate traffic is to be expected, as well as the most immediate returns upon any outlay upon the river works.

10. Such being the geographical position and capabilities of the country traversed by the Godavery, let us next notice its present means of communication with the coast, and its condition in regard to trade and revenue.

These

* The country round Nandair was spoken of by Colonel Davidson, the late Resident at Hyderabad, as a remarkably fine productive tract. He particularly directed my attention to it, as likely to be an important source of traffic. It lies, however, on the main Godavery, which, though navigable for some hundreds of miles, has a long series of rocky rapids between Nandair and the confluence of the Pranrita.

† This fact was particularly pointed out in my original Report of May 1856. The watershed between the Wurda and Poora is quite low, and has been examined by Sir A. Cotton. It presents no difficulties whatever to the construction of a canal.

‡ Population of British Territory	-	-	-	-	-	-	4,900,000
Ditto - - Nizam's, including Berar	-	-	-	-	-	-	2,177,000
Total	-	-	-	-	-	-	7,077,000

But from this about 1,000,000 might be deducted for the population of the most distant part of Chutteesghur, leaving 6,000,000 for the country whose trade would naturally take the Godavery route.

These points have all been fully described in Mr. Temple's Report, and a brief statement based upon the facts which he reports will here be sufficient.

First, as to communications. There is no traffic by the river in its present unimproved state*, and the only outlets to the coast on the north bank have been mere cart tracks, or unmade roads, practicable only in the dry season for the most primitive description of country carts or pack-bullocks. There are three such roads; one leading westwards from Nagpore to Bombay; another northwards from the same point to the Ganges at Mirzapore; and a third southwards along the right bank of the Godavery, through the Nizam's country, to Masulipatam.

The Chutteesghur Country has also two outlets, both bullock tracks; one to the east to Cuttack, and the other from Raipoor southwards to the Godavery, and thence to Masulipatam.

The cost of carriage by these rough and primitive modes of conveyance is so great as to be prohibitory of all trade except in articles of the very highest value, such as cotton, and in their case only in small quantities. As a consequence, the whole Godavery basin has been practically isolated from the commerce of the world. Its only markets have been within its own limits, and its people are engaged almost exclusively in raising their own food and clothing.

11. For the districts on the Nizam's side of the river no statistics exist, but it is certain that they are at least no better off than those in British territory, and the condition of by far the most flourishing of the latter, as revealed in Mr. Temple's reports, plainly indicates the state of poverty and depression of the whole. Thus we have for the valley of Nagpore, to which attention has been already directed as the most populous and best cultivated part of the whole valley, the following statistics:—

Population	- - - - -	3,140,000
Revenue	- - - - -	£. 289,200
Exports	- - - - -	£. 291,500

With this we may compare the condition of the coast districts at the mouth of the same river, districts whose great staple is rice, a grain of low value, and which are not adapted to the growth of the rich and valuable products which, as cotton, linseed, &c., form the staples of so large a part of the Upper Provinces; districts, moreover, only partially improved, the irrigation of the land very incomplete, but possessing an unbounded demand for their produce, and access at an almost nominal charge to the port and to the markets of the world.

	Population.	Revenue.	Exports.
		£.	£.
Nagpore - - - - -	3,140,000	289,200	291,500
Rajahmundry - - - - -	1,200,000	450,000	350,000

Reduced to the unit of each head of population, the comparison is as follows:—

	Revenue per Head.	Exports per Head.
Nagpore - - - - -	2 shillings	2 shillings.
Rajahmundry - - - - -	7 „	6 „

But these figures do not show the whole truth of the case. As regards exports it should be stated that, while those of Rajahmundry consist mainly of rice and oil-seeds, worth only 5 l. to 8 l. per ton, half those of Nagpore consist of cotton, an article worth 36 l. per ton on the spot. Unless, therefore, Nagpore had possessed this important staple, so valuable that it will bear the present excessive cost of transport, its exports would have been but a small part of what they are. Moreover, as regards the effect of this trade upon the people, it is important to notice that at present it is carried on under such formidable difficulties and risks that it is entirely in the hands of a few wealthy merchants who appropriate by far the greater part of the profits, so that that which falls to the share of the great mass of the people is far below 2 s. a head.

As

* Excepting timber, which is floated down in rafts from the Bustar country and Godavery districts, to the extent of, perhaps, 50,000 logs annually. Mr. Temple mentions 23,000 logs as having been exported, from one part of this tract only, in 1862.

As regards imports, we find salt imported to the extent of 7,400 tons* only for a population over three millions, or at the rate of 5 lbs. per head, the retail price being† 8 lbs. to 12 lbs. per rupee, about three times that in the coast district, and the consumption not above one-third what there is good reason to believe it to be in those districts, or one-fourth of what it is known to be elsewhere.

We find, moreover, this valley, though exporting such a small amount of raw produce, and with a mere fraction of its population engaged in manufacturing pursuits, largely importing food from the surrounding district‡, not even growing enough to meet the very limited wants of its own people. And yet there can be no question that it is the most prosperous part of the Godavery basin, possessing a soil and climate adapted to the growth of the most valuable products, with a firm and strong government, earnestly bent on improving its condition; with just and equal laws, securing to every one the fruits of his labour; and with a very light land tax. The districts on the Nizam's side of the river, while sharing, perhaps, to an equal extent, the natural capabilities of this valley, possess none of its other advantages, while the wants and disadvantages which they have in common with it are aggravated by the evils of unjust and oppressive government.

And it cannot be too strongly insisted upon, that such as this fine country is, in its present depressed and impoverished condition, such it must remain, in spite of every improvement that may be introduced in the general administration of the government, in the tenure and assessment of the land, and in the education and enlightenment (if that be possible under such conditions) of the people, so long as the only stimulus to exertion is the necessity to support life, and the accumulation of wealth is rendered impossible by the absence of a market for anything beyond the requirements for home consumption.

In a purely agricultural country like India, there is but one source of wealth, its surplus produce, and the only markets for this lie beyond the sea.

The first and fundamental necessity, therefore, to such a country, next to the establishment of order and maintenance of public security, is cheap communications with good ports on the coast; and until this is provided for Nagpore all else that may be done for it will be of no avail, the condition of its people cannot possibly be, in any material degree, bettered, or its revenue increased.

This leads me to consider in the next place,

12. What communications are now being constructed, or have been proposed, for the Godavery Valley?

I trust that it will not be thought that in the remarks above made I have been wasting time in the repetition of mere truisms. I cannot think that the real condition of the Godavery country is rightly apprehended, or the fundamental necessity for really cheap transport clearly seen. Were it otherwise, I feel sure that an expenditure of even two or three millions (were such a sum at all necessary) upon a line of transit which should place six millions of people, the cultivators of a fairly productive soil, in communication with a good port, would not be thought too much, and that the idea of substituting a common road for such a line could never for a moment have been entertained; never at least until the fullest investigation had established the impracticability of opening the river. For the following simple and obvious calculation upon the subject at once presents itself. If a river communication with the coast would be likely to have such an effect upon the people of the Nagpore Valley *alone*, as to enable them to pay a revenue per head only *half* that now paid in Rajahmundry, the increase of revenue would be 250,000 L., which alone is eight per cent. on 3,000,000 L., independently of other sources of profit. I desire not to dogmatise, or to discuss questions not strictly pertinent to the subject under consideration; but I would respectfully submit that if the statistics above given of the Nagpore Province at all fairly represent the state of the case, the condition of the people of the Godavery Valley is one of depression and poverty, mainly arising from the want of incentive to exertion which access to good markets alone can supply. And if this be admitted then I would further submit that no adequate measures have yet been taken to remedy this state of things.

With what object, I would venture to ask, are we now making roads in these provinces, the road from Nagpore to Raipore, for instance? Except for the carriage of military stores, the only use of that road will be to enable Chutteesghur to send food more cheaply to Nagpore, and to carry back the rupees received for it; but as both districts grow, or might grow, their own food, this process clearly cannot lead to any increase in the total production, *and without such increase the wealth of the country cannot be increased by a single rupee*; matters must remain just as they are now; there may not be the same inequalities of production, but the general level to which all will be brought must still be one of poverty; the population must still continue, as now, to be engaged almost exclusively in raising its own food. The same remarks apply to the road from Chanda to Nagpore, and in fact (I

say

* "The average consumption of salt in the country of Nagpore proper amounts to two lakhs of maunds per annum from Bombay."—Mr. Temple's Report.

† Mr. Temple gives the price at 16 lbs. per rupee, but, unless this is a clerical error, I can have no hesitation in saying that he must have been misinformed upon the subject. The monthly price lists published for every district in the Central Provinces show that the rates are as above given, *excepting in the Godavery districts* where the price is given at 16 lbs. per rupee, the fact being that the salt is now largely imported by the river for the workpeople, and sold, at the date mentioned, throughout that part of the country.

‡ Nagpore, though essentially a wheat-producing district, has hitherto sent none of its cereal produce away. On the other hand, it imports both wheat and gram largely from the Nerbudda Valley, and more recently from Chutteesghur, in the east."—Mr. Temple's Report.

say it with reluctance, and in the earnest hope that if wrong my error may be pointed out), to the greater part of the roads throughout Central and Southern India.

I turn, for instance, to the map of the Madras Presidency, and find it seamed all over with roads, some parts of it thickly so. I call to mind the large expenditure which has been incurred in the construction and maintenance of those roads in the last 15 years, and yet, with the exception of the Deltas of the Godavery and Kistna, a small and insignificant part of Vizagapatam, and the districts at the extreme southern point of the Peninsula where the distance between the two seas is so small, I look in vain for a single district which has cheap communication with a good port—the very first essential in such a country. Roads are, no doubt, of use in their proper place and time, but to cover the whole country with them without giving it really cheap access to good ports will have no material effect upon its condition.

And this result seems evident from the very small advance made by the very districts whose *internal* communications have thus been pushed forward without any facilities being given for their external trade.

It is reasonable to suppose that if the same expenditure had been applied to the opening of two or three great lines of transit leading from safe ports into the heart of the country, the effect upon the country and people would have been very much greater.

It is because we are now engaged in Nagpore in the construction of such roads in applying to them the funds, which, I humbly conceive, would be far better devoted to the opening of the river, and because the substitution of a road for the river, suggested by the Government of India, is a question for consideration, that I venture to offer these remarks upon the subject.

13. There are three lines of communication between the Godavery Valley and the coast, the claims and comparative value of which have to be considered—

The railway from Bombay to Nagpore.

The Godavery.

A road running generally parallel to the Godavery.

The first is in course of construction, and well advanced towards completion.

The second has been commenced; but the question has been raised whether it might not with advantage be abandoned in favour of the third.

1st. The railway. The question for consideration in reference to it is, not whether it was advisable or not to make such a line—with that we have here nothing to do, the line is well nigh finished; nor is it whether the railway will be of benefit to the country through which it runs—that is foreign to the subject in hand. The question is this. The most populous and productive part of the Godavery basin is the Valley of Nagpore. The railway enters this in its upper part, from the west, and has its terminus at Nagpore. It has further been proposed to extend the railway to Raipore,* crossing the Valley of the Wyne Gunga, and thus running through an important part of the river basin. To what extent is this line likely to affect the country? In what degree will it supply the wants of the Nagpore Valley? Is there a probability that it will so far meet its wants as to render the extension of the Godavery navigation (supposing that to be possible) into it a matter of little importance?

These questions seem to be distinctly raised. There may be not a few who would answer the last in the affirmative. The Chief Commissioner, Central Provinces, speaks of the railway as likely to be an “*inestimable advantage*” to the districts under notice, and the opinion is, doubtless, held by many. The question, however, has never been discussed, and some remarks upon it in this place will clearly be appropriate.

14. There are two questions in regard to the probable effects of a railway upon any given district. 1. Whether it can carry cheaply enough to attract traffic? and 2, Whether it can carry off the traffic thus drawn to it?

The case is quite conceivable, and not uncommon, in which such a line of communication might satisfy the first condition, and yet be wholly unable to meet the second; for every railway clearly has a limit to its capacity for traffic.

On the other hand, the cost of transport by rail may be unsuited to the wants of the country, and the traffic on this account inconsiderable.

In the latter case the line is plainly of no value to the country.

(I speak now with reference to the *commercial* wants of the country, leaving out of consideration the use of the line as a military communication.)

In the former case, the value of the line though great, must be limited, and in comparison of the extent and resources of the country traversed *may* be small, and to the most distant parts insignificant.

It is also clear that the further a railway advances into a country the less traffic will it attract at its extremity, the cost of carriage increasing with the distance from the port, till at last a point is reached beyond which it will cease to attract any export traffic whatever. Moreover, this limit may be determined by another cause. The capacity of the road for traffic may be exhausted before its extension inland has reached the distance at which export or import trade by it ceases to be profitable.

It is evident, therefore, that the assumption that a railway, simply because it is a railway, must benefit in an important degree every district it passes through, is erroneous. It *may* do so, under certain conditions, but it also may not. The cost of carriage by it for the distance at which the district in question is situated from the sea may be greater than

articles

* See Mr. Temple's Report upon the subject. Raipore is the principal town of Chutteesghur.

articles of export will bear; or the traffic on the line before it reaches the particular district may be all that the line can accommodate. I speak of the *export* trade as deciding the question, because when there are no exports there clearly can be no imports, and the *local* traffic in a country with no external trade must be insignificant.

15. Now, which of these supposed cases is likely to apply to the Bombay and Nagpore Railway? It enters the Nagpore Valley at a distance of 500 miles* from Bombay, and the questions that arise are, 1. Will the cost of carriage by it be such as to give rise to such an increase of production as we have reason to believe that valley is capable of? What amount of traffic is such increase likely to cause? Can the railway accommodate such traffic, either as a single or a double line?

In answer to the first question, it may safely be said that in no country in the world, in conditions at all similar to India, does a railway, entering a particular tract at a distance of 500 miles from the sea, produce any but the most insignificant effect upon it. In fact there is but one country in the world at all like India, a purely agricultural country, whose wealth consists simply in the raw produce it exports, and that is America, where such a line is to be met with, and there the result is as described. There there may be two or three such, and they have a local traffic, and a small *through* traffic, but the exports by them from distances of 500 miles are insignificant; these go in every case by water, even though that be available for only eight months in the year, and the prosperity of such inland tracts is entirely owing to the facilities they thus possess for cheap export. Such lines have a value in a country like America, already provided with the finest system of internal navigation in the world; but the *wealth of the country* is made by the water lines, and is wholly dependent upon them. Thus we find the auditor of the New York State Canals speaking thus in 1860: "The conflict of political partizanship has not been the least evil encountered during the last 35 years of intense struggle which has been going on while our public works were moving to an enlargement and completion. The canals have forced themselves into public confidence, and we have the gratifying spectacle of seeing that the commercial tonnage borne upon their imperial waters in 1860, was a little more than *seventy* per cent. of the whole import and export tonnage of the United States."

This, be it remembered, is said of a country where there has been the keenest and most reckless competition between the different carrying lines, and where there is a larger extent of railroad than in any other in the world; for where once a country possesses the essential elements of wealth in a fertile soil, a free people, just laws, and *water transit*, railways will follow, and both feed upon and increase the wealth thus created.

This case of America is, in respect of this question, parallel to that of India, and is the only one that is so. No similar case is to be found in a manufacturing country like Europe, where goods of high value have to be moved, and where the distances are not above a tenth of those in India, while at the same time *water-carriage is everywhere available*.

No data for determining this question are to be had from India, because there the railway lines are but recently made, and it may be thought that they have not yet had time so to develop their traffic as to render present results a safe guide as to what may yet be expected of them. What we need to furnish a really parallel case to that of the Bombay and Nagpore railroad, is a purely agricultural country, with little or no manufactures, and *without water communication*.

The last is an important condition; for where the wealth of a country has already been largely developed by means of cheap water carriage, railways may follow and find considerable traffic in the articles which a *wealthy* people require.

Unfortunately, such a strictly analogous instance is not to be found; the most similar case is that, as above said, of America, where we have large productive tracts at a great distance from the sea-board, and so far in conditions similar to the inland provinces of India, but differing in this respect, that before the introduction of railroads they possessed a magnificent system of internal navigation by river and lake, which had been largely improved and extended by means of canals. They were not, therefore, isolated tracts like those of Central India, shut out altogether from the general commerce of the world, but, having already ample means of export for their produce, were rapidly accumulating wealth, and were, therefore, prepared to receive, and to give employment to, the new and more expensive mode of transport suited to the requirements of a higher civilization.

16. Let us, however, select for comparison those States which are in circumstances most nearly resembling those of Central India, viz., the Western States, lying around the southern and western margin of the Lakes.

A great part of their produce is exported eastwards by the Lakes, and by the lines of canal and railroad which connect the Lakes at Buffalo and Dunkirk, with New York. There are three such lines; 1. The Erie Canal and Hudson River; 2. The New York Central Railroad and Hudson River; 3. The Erie Railroad, connecting Dunkirk with New York. By these three routes the Western States exported in 1862 to New York

3,950,000

* In round numbers.

† Lengths :	Canal	-	-	-	-	-	-	-	360 miles.
"	Hudson River	-	-	-	-	-	-	-	150 "
"	New York Central Railroad	-	-	-	-	-	-	-	325 "
"	New York and Erie Railroad	-	-	-	-	-	-	-	445 "

3,950,000 tons of produce (which, it may be remarked, had, before being shipped to these lines, been carried 500 to 1,000 miles by the lakes) to New York, and* of this quantity 3,150,000 tons, or 80 per cent., went by the canal.

Now, to comprehend the full significance of this fact (and if space permitted it might be greatly strengthened by similar comparisons for other parts of America) it is necessary to observe—

- 1st. The two railroads are both double lines.
- 2nd. They are in direct competition with one another and the canal.
- 3rd. They are, of course, open all the year round.
- 4th. The canal is closed on an average for four and one-third months of the year, and was closed for three and two-third months in the year in question.
- 5th. The canal is as yet without steam power, though this has lately been introduced in most of the English canals with great diminution of expense.†

A part of these exports are for the consumption of the manufacturing States in the Atlantic; and of the remainder, which are sent to Europe, an increasing proportion goes by steamers making the passage in 10 or 12 days.

Time, therefore, is in this case already an important element. Shipments of produce at Buffalo are constantly ordered by telegraph from New York.

In spite of every disadvantage the canal thus carries 80 per cent. of the whole tonnage. Why? Clearly because it carries more cheaply than the railroads. It carries more slowly, and for only two-thirds of the time; but being the cheapest route it nearly monopolizes the traffic.

Let me here again explain that I am not now discussing the question of water *versus* rail. The case would have been just the same had it been road instead of canal against railway, supposing it to carry as cheaply. The object is to show that in America the railroads do not carry more than a fraction of the great traffic of the inland States, and that if those States have a large export trade, or rather the largest in the world, it is *because they have water-carriage*.

17. If we now apply this illustration to the case of the Bombay line, we find that the adverse conclusions above drawn as to the effect of railways in America are greatly strengthened in its case, for (1) the cost of the line is greater; (2) the working expenses are, probably, greater, owing to the greater cheapness of fuel in America; and (3) the profits on the passenger traffic must be but a fraction of those on the American lines, where the charge is 1 *d.* to 1 ½ *d.* per head per mile, against ¾ *d.* to ½ *d.* in India; (4) the sea passage from India to Europe, occupying three *months*, instead of only 12 *days* from America, speed in the transport of goods from the interior to the coast is a matter of far less importance than even in America, where we find that, in spite of the superiority of the rail in this respect, the great mass of the exports move by water.

18. But it is further to be considered that while the railway can certainly carry no cheaper than in America, the need of cheap carriage in India is even greater than in that country, for these reasons: (1) that the value of the exports is less, and (2) that the cost of the ocean transport to the markets of Europe is greater.

Let us take the article of cotton, for instance, the most valuable product of Central India, and let us suppose that by the railway it is carried to the coast for one anna per ton per mile, or 33 rupees a ton. The total freight on it from Nagpore to Liverpool would then be:

Carriage to the port	-	-	-	-	-	-	33 rupees.
Freight by sea	-	-	-	-	-	-	25 „
TOTAL							58 „

On

* This was in spite of the keenest competition on the part of the two railroads, a competition which only a great superiority in *cheap* carrying power in the canals can withstand, for were the rival routes at all on equal terms in this respect, the railway companies being carriers and from their immense capital able to make large sacrifices, if necessary, to crush opposition, would inevitably win in a contest where their opponents are a number of private carriers of small means, dependent on their earnings for the means of maintaining their trade. That the railway companies do thus frequently carry at a temporary loss in order to put down opposition is well known, and in this particular instance the following extract from the report of the State Engineer of New York for 1863 shows that the two lines in competition with the canal have not scrupled to sacrifice earnings in order to secure a larger share of the traffic:

“It will also be noticed that, in 1861, the averages on the New York central railroad have run down from 3.13 cents in 1857, to 1.96 cents a ton a mile—a reduction of 1.17 cents a ton a mile; that the averages on the New York and Erie have run down from 2.48 cents a ton per mile in 1856 to 1.73 cents in 1861—a reduction of three-fourths of a cent or 7.5 mills, which is equal to a loss of 1,885,125.19 dollars on freight. This road received in 1861 194,336 dollars less in freight than in 1856, on an increased carriage of 67,892,081 tons carried one mile. It will be found on examining the tables that the New York and Erie railroad carried, in 1861, 310,203 tons more than in 1856, of through and way freight, but the aggregate earnings were 194,336 dollars less.”

That the canal prospered in spite of such competition is shown by the fact, that although in the next year, 1862, the tolls were raised to a higher figure than they had stood at for 10 years, the total movement in the canal increased from 863,623,507 tons one mile in 1861 to 1,123,548,420 tons one mile in 1862.

† “The cost of haulage by horses is one halfpenny per ton per mile; that by steam tugs a little under a farthing per ton per mile (about one-sixth of 1 *d.*) These are the rates charged to traders on the Ashby-de-la-Zouch Canal.”—*Thames Navigation Improvement Report*, para. 517.

On the American article the corresponding charges would be :

Carriage to the port (1,000 miles)	-	-	-	12 rupees.
Freight by sea	-	-	-	12 "
				—
TOTAL	-	-	-	24 "

Thus, the cost of bringing the inferior Indian cotton to market would be two and half times that of the American cotton, which is at least twice as valuable. The Indian cotton, which from its lower value can least bear the cost of carriage, would thus be burdened with a charge two and a half times as heavy as the American, or in proportion to its value, five times as heavy.

This is equivalent to an enormous protective duty in favour of the American producer.

The comparison with other cotton-producing countries, Egypt for instance, would be equally unfavourable. India competes with them all at a great disadvantage. Its cotton is of inferior quality, and it is much further from market. Clearly, therefore, if India is to compete successfully in the European markets it is essential that the *only* charge upon its cotton capable of reduction, that for transport to the port, should be cut down to the lowest possible amount.

The railway will, undoubtedly, effect an important saving in this respect, and so lead to a certain increase of production, but to nothing like what would follow a reduction of the cost to American rates, if that be possible. The amount of relief which it will afford to the Indian grower will be comparatively small, and much below what is required, and what will be shown to be practicable.

The excessive prices of the last four years have rendered cotton-growing such an extremely profitable pursuit that every country in the world has attempted it, and several which, previous to the American war, had no trade in this article, now find that they are quite capable of producing it of good quality at a remunerative rate. Fresh competitors are thus introduced into the market, and the margin of profit to the grower must become less and less. No country, therefore, and certainly India least of all, can afford to neglect any means of reducing to the utmost the cost of bringing the article to market.

19. The case is equally strong as regards the less valuable products, as oil-seed, wheat, rice, &c. The range of climate and soil adapted to their growth is less restricted than in the case of cotton: the area of production is, consequently, wider, and competition freer. The grower of Central India, therefore, needs all the help he can get from the cheapest means of export to enable him to utilize to the full such advantages as he possesses. Agricultural produce of this class varies from 70 to 120 rupees value per ton in America, and is delivered at the port for four and five rupees a ton. In Central India it is worth 40 to 80 rupees, and the freight by sea to the European market is at least double that from America. It is, then, of the greatest importance that the cost of bringing it down to the coast should be kept down to the lowest possible amount. But the railway charge (at an anna per ton) would be 32 rupees, six times what it is in America on an article of higher value. That cannot be thought a suitable mode of transport which thus discriminates against the Indian grower in favour of his American rival; nor can we expect in Central India, under such conditions, any such development of its capabilities or expansion of its trade as we witness in the case of the American States, situated at a distance three and four times further from the coast.

20. But, again, the necessity for cheap carriage in a case of this kind is not limited simply to the export requirements of a country. It is equally needed to supply in sufficient abundance, and at the lowest rates, those articles of low value which constitute what may be called the raw materials of agriculture, and which are amongst the first requirements of an agricultural community, such as manure, lime, fire, timber, and building materials. Wherever agriculture is in a healthy and flourishing condition, articles of this class circulate in enormous quantities, and from their bulk and low value are always left to the water lines for conveyance. A cheap and abundant supply of these is as essential to the profitable production of such expensive articles as cotton, as to that of the less valuable products. It is only where these are available at low rates, that any improvements in agriculture are possible. The Indian ryot now uses as fuel the manure which he would apply to his land, were any cheap substitute to be had. He grows wheat and millet where he might grow cotton, if he could get his food as cheaply from elsewhere. He pays for salt what ought to be laid out on other articles. Cheap coal, cheap minerals, and cheap food, are necessary to cheap manufactures; and precisely similar conditions are essential to cheap cultivation. Even if a railway could carry off the cotton at a sufficiently low rate, it could not supply the grower with all the other essentials to good husbandry, such as are required to improve the staple and value of the article, and to extend to the utmost its production.

21. To the above considerations may be added the great disadvantage at which Central India, provided only with a railway, must compete with the coast districts, with Rajahmundry, for instance, where articles of all descriptions, cheap or valuable, are carried at such very low rates. Such districts must, of course, retain a certain superiority inseparable

able from their position; but this should not, and need not, be such as is involved in a difference of 40 and 50 rupees a ton in the cost of export.

This investigation of the question can lead to one conclusion only, that the railway now approaching completion does not possess such capabilities of cheap transport as are needed by a country in the condition of Central India; and that the inference to be drawn from the experience of other countries similarly situated is greatly strengthened in this particular instance.

22. But there is yet another question to be considered. Could the railway, supposing it to carry at rates low enough to attract the traffic of Nagpore, accommodate it? Could it convey to the coast, and *vice versa*, all the traffic that would flow to it? And the first point to be settled is this; supposing that country provided with really cheap means of carriage, what is its trade likely to be?

Here, again, India as yet furnishes no data for comparison, though some of the more improved districts afford some useful facts.

To find a case similar to that supposed we must again resort to America, where we find not only the special advantages in regard to communication now supposed, but all those other inducements to exertion, such as secure land tenures, and proprietary right in the soil which, if they as yet exist but in part, it is the aim of the Government to afford to the people of India.

And we may form some idea of what the trade of an agricultural country, under such circumstances, like that of Central India, is likely to be, from the instance above given of the Western States of America. We have seen that they export by the eastern route 4,000,000 tons of produce annually. The population which contribute this traffic is about 6,000,000 souls. This gives for the export trade alone about two-third ton per head. If the proportion were anything like this in India (and it is not necessary now to pause to inquire whether it might be more or less), there would be an export tonnage from the Nagpore Valley of 2,000,000 tons per annum.

Could the railroad carry this, or what portion of it could it carry?

The trade basin of the railway between the Western Ghauts and the Wurda, exclusive of the main line beyond the junction of the Nagpore line, covers an area of 29,790 square miles, containing a population of about two and a half millions.*

The railway will, of course, receive the traffic of this tract before it can carry away any from Nagpore; and we may form some idea of what this may be, and of the capability of the railway to carry it off, from the fact that two double lines of railway (worked almost to their utmost capacity) running through the principal part of a population of three millions in the State of New York, *derive two-thirds of their tonnage from it alone*, besides all that the Erie Canal and the Hudson River carry off.

It is quite plain, therefore, that the Bombay Railway, even if a double line, which at present it is not, cannot possibly carry more than a fraction of the traffic which must flow to it, from its own trade basin west of the Wurda, if its rates are sufficiently low.

But not only has it to carry the traffic of its own trade basin, it must also carry off that which the main line passing through Central India, above Bhosawul, will bring down, and this will pass through a population of some millions more. Evidently, then, it would require several lines of railway to accommodate the traffic of the country to the west of the Godavery Valley alone. How hopeless then to expect that the railway can possibly afford vent for the trade of that valley, or of any part of it? †

23. It

* A dotted line in the map shows the limits of the tract whose trade would naturally flow to the railway. Its area is as above stated. Its probable population is thus deduced from returns of that of three large districts which it includes:

	Area.	Population.	Population per Square Mile.
Candeish - - - - -	9,311	778,000	83
Ahmednuggur - - - - -	9,931	996,000	103
Dowlutabad - - - - -	2,900	194,707	67

The return for Dowlutabad applies to the year 1849, when the population was stated to be only recovering from the effects of various causes which had operated greatly to diminish its numbers.

The mean of the above, or 84 to the square mile, has been taken for the average population of the whole tract.

The calculation, if worked out, according to the American data, would stand thus:

	Tons.
Traffic of trade basin of railway from Bombay to Nagpore, at two-thirds ton per head of population - - - - -	1,666,000
Ditto of basin of main line above junction of Nagpore line at Bhorawul. for, say 3,000,000 of population - - - - -	2,000,000
Total traffic of trade basin west of the Godavery Valley - - - - -	3,666,000

The total capacity for traffic of a *double* railway of similar length is reckoned, by Mr. McAlpin, State Engineer of New York, at 1,500,000 tons per annum, and neither of the two busiest lines in the States, those in competition with the Erie Canal, have yet exceeded 1,250,000 tons. The above traffic would, therefore, be more than sufficient for two double railways, even if there were no such special difficulties as the inclined planes at the Ghauts, must present to the working of such a heavy traffic. Then, *in addition* to the above, the exports from the Nagpore Valley alone would be 2,000,000 tons. If such a traffic be compared with the capabilities of the present railroad, partly single and partly double line, the utter inadequacy of this route to the requirements of the country will be strikingly apparent.

23. It may be thought that these illustrations, drawn from America, are inapplicable; that the two cases are too dissimilar for comparison. There are, of course, some points of difference in respect of the character of the two peoples, the extent of land available for cultivation, and the ease and security with which possession may be obtained and held. It is not meant to say that India, as it is now, is a fit subject for comparison with America, as it will be; but that India, improved to the extent at which the Government now aims, fertilised, and its produce increased and secured by the application of water to the soil, and provided with such cheap means of transport as America now enjoys, must furnish results not inferior to what we now witness there. For it has a soil capable of yielding much higher returns to agriculture than that of America now does. Land watered in India yields from 30 to 60 bushels to the acre, while the average of that of the American States above cited is only 12. Its productions, also, are much more valuable, combining those of the Southern American States with those of the North, and its population, that at least of Central India, is from 40 to 90 to the square mile, that of the Western States of America being 22. In these respects, and in the essential particular of both countries being exclusively agricultural, and dependent upon foreign markets for the sale of their produce, there is at least such a degree of similarity as to justify the comparisons above made. The results so obtained are, moreover, confirmed by what we now witness in the case of those few districts in India where similar improvements have been carried out. In Rajahmundry, with a soil only partially irrigated, and without that confidence which a permanent assessment of the land tax gives, but with cheap water carriage to a good port, already some hundreds of thousands of tons of produce and imports pass through its canals, though the benefits of these improvements are not fully enjoyed by the whole of its population. The traffic in the main canals leading to the port must be now somewhere about one-third of a ton per head of the population, against two-thirds of a ton in the Western States of America. It is important, also, to note that the trade of the district has reached this degree of expansion within 14 or 15 years from the time when the benefit of the improvements first began to be felt, showing how mistaken is the idea that the effect of such trials is only to be looked for in a distant future. In America, as is well known, the emigrant begins to export the first year that he breaks up the soil.

24. From such instances as these, and from such only, as it appears to me, can correct ideas be formed as to the probable effects of improved and *cheap* communication in India.

Nothing can be more fallacious than to argue from existing trade as to what it is likely to be under such totally dissimilar conditions, and no assumption more unfounded than that speculation upon the subject is useless. Unless we can form some definite idea as to the probable value of any particular line of communication, it will be impossible to decide whether it may be worth while to spend 100,000 £., or 1,000,000 £., or 2,000,000 £. upon it. I trust, therefore, I shall be excused for devoting so large a space to the discussion of this question.

25. With regard, then, to the Bombay and Nagpore Railroad, the obvious inference from the above investigation is that neither in respect of cheap carrying power, nor of capacity for traffic, can it at all meet the requirements of the Godavery Valley. If this be not admitted, then we must take our choice of one or other of the two following conclusions :—

Either, 1st, if the railway rates of carriage are such as to produce any important effects upon the production of the country it traverses, the amount of traffic which must flow to it long before it reaches the confines of the Godavery Valley will be such as no single or double line of railroad can possibly convey, such, indeed, as it would require several lines to carry off. In this case the railway can manifestly be of no use to the Nagpore province.

Or, 2nd, if from inability to carry at such rates as will thus benefit its own trade basin, its traffic should prove to be such a fractional part of that above supposed as it can accommodate, the defect which will thus so greatly diminish its value to the districts nearer the coast must tell with far greater effect in the case of those more remote. If the rail cannot carry cheaply enough for its own trade basin, *à fortiori* will it fail to do so for the Godavery Valley.

Whichever of these alternatives we may adopt, the conclusion is the same, that the Godavery Valley requires for its improvement a distinct line of communication with the coast altogether.

This must be by the river, if practicable; but before passing on to this part of our subject a brief notice must first be taken of the suggestion that a road which would cost no more, might, perhaps, be advantageously substituted for the water line.

26. This suggestion is made* on the supposition, which I shall presently show to be mistaken, that the river would be open for use during only four or five months of the year. Were the Government of India satisfied that a more lengthened period of navigation were practicable, doubtless the idea of a road as an alternative would be at once abandoned.

It will be sufficient, therefore, briefly to direct attention to two considerations.

1st. The

* By the Government of India in their proceedings of 13th September 1865.

1st. The high cost and difficulty of forming such a road, and the special objections in regard to the jurisdiction of the country which it must pass through.

2nd. The high cost of transport by such a road, such that it could afford no relief to the greater part of the country it would traverse.

With regard to the first point, the cost is estimated at 1,600*l.* per mile, that being (establishment included) about the cost of roads in the Central Provinces.

But it is quite evident that, if this road is to be carried through British territory only, that is, down the north bank of the river, it must be specially and abnormally expensive, for (1) it will have to cross not only three great rivers, each fully half-a-mile in width, but the whole of the drainage of a tract 16,000 square miles in extent; and (2,) when it reaches the Eastern Ghauts it must be carried right up over them and down again into the low country beyond, there being no pass on that side of the Godavery, and the passage along the bank of the river being perfectly impracticable, owing to the precipitous character of the hill sides, which could only be rendered practicable for a road at an enormous expense. It is evident that the ordinary cost of roads in a country like Central India, where there are no special difficulties, can be no guide as to the expense of a road constructed under such conditions.

Moreover, all the peculiar difficulties which the climate and paucity of population along the Godavery present to the construction of the river works, where labour has to be concentrated at one or two points only, where proper shelter and supplies of food can be provided, must be greatly increased in a case where the working parties would be scattered along a line of 250 miles in length.

If to avoid these difficulties the road be taken along the line of the existing cart track, on the right bank, it must then pass for 250 miles through the Nizam's country, where there could be no security for the traffic against plunderers, and where the conflict of jurisdictions would continually lead to difficulties and embroilments with the native government.

27. As regards the cost of transport by such a road, it is evident that in this essential point such a communication must altogether fail to exercise any important beneficial effects upon the inland districts. Even if we take the rate per mile at two annas (Mr. Temple states it to be three annas in the Central Provinces), the cost for 450 miles would be 56 rupees (5 *l.* 12 *s.*) per ton, many times what would be necessary so to raise the value of produce in the interior as to give any great impulse to production, and six times the cost by the river. Even with a four or five months' navigation (and I shall presently show that this is far less than what may be had) the river would be a much more valuable communication than the road. For the cost by water would be only nine rupees a ton, or 45 rupees less than by road, while the average value of the great bulk of the produce being only 50 to 60 rupees a ton, the interest at even 20 per cent., for the six months of interrupted navigation during which produce would have to wait for export, would be only six rupees a ton, leaving a clear gain of 39 rupees a ton in favour of the river. It is not too much to say that the river, even if available for four or five months only, would be of the highest value to the country (on which point the Government of India have already expressed a most decided opinion), while the road would be such an expensive mode of conveyance that the money expended upon it could benefit the country in a very small degree.

I pass on to notice the only remaining alternative mode of communication with the coast, the Godavery.

THE GODAVERY.

28. The line of least descent in the Valley of the Godavery is that which, commencing at the Wurda, near Hingenghat, follows the course of that river and of the Godavery to the sea. The total distance between Hingenghat and the Port of Cocanada is 445 miles. The whole of this length of river would be navigable were it not for the obstructions caused by rocks in the bed at three points. To these three rocky reaches the name of barriers has been given, and they are situated as follows:—

	Length.	Distant from Sea.
First barrier - - -	8 miles.	142 miles.
Second barrier - - -	14 „	220 „
Third barrier - - -	36 „	309 „

The first and second of these rocky reaches may be passed by steamers at certain times during the flood season, when the river is full enough to submerge the rocks. The third can hardly be said to be navigable at any time, though a steamer has been taken over it. The open reaches of river between these barriers have a gentle slope well adapted to navigation. They are in length as follows:—

Sea to first barrier - - -	142 miles.
First barrier to second barrier - - -	70 „
Second barrier to third barrier - - -	75 „
Third barrier to Hingenghat - - -	100 „

There are thus 387 miles adapted to navigation, and 58 which are not so.

The river, deriving its supply solely from the monsoon rains, partakes of the character of

of the seasons, and has an abundant supply of water, with occasional heavy floods, during a portion of the year, and during the remainder a much smaller and, as the hot season advances, gradually decreasing stream.

Such navigation as it is capable of is thus naturally divided into two parts:—

- 1st. Monsoon navigation, from July to November inclusive.
- 2nd. Dry weather navigation, from December to June inclusive.

29. A survey of the river was made by order of the Madras Government in 1855, with the view of determining the cost of opening the river for navigation, for periods of greater or less duration in each year.

The result was the submission of a scheme for works, estimated to cost as follows:—

	£.
1st. For removing all the existing obstructions caused by rock, including the works required at the three barriers - -	300,000
2nd. For regulating and replenishing the flow of the stream so as to make it navigable during the dry season* - -	360,000

It was calculated that the first part of the scheme, if carried out, would render navigation practicable for eight or nine months of the year. The Madras Government declined to take up the second part, considering that the first possessed an important value of its own, and might, after completion, be supplemented by the second, if necessary.†

30. Two distinct projects were thus placed before the Government:

Estimated to cost.

	£.
1. The Monsoon navigation project - - - - -	300,000
2. The dry weather - - - - -	360,000

On the strong recommendation of the Government of Madras, the Court of Directors ordered the first to be carried into execution, so soon as there should be funds available for the purpose.

No constructive operations, in furtherance of this project, were undertaken before 1st January 1861.

In the interim the following expenditure had been incurred:

	£.
In 1855-56-57 - - - - -	13,347
In 1859-60, to 31st December - - - - -	2,436
Total - - - £.	15,783
Viz., in 1855. For survey of river - - - - -	6,000
Blasting and removing rock in the two lower barriers † - - - - -	5,700
1857. Construction of two temporary locks in first barrier § - - - - -	914
„ Temporary improvement of shoals - - - - -	720
„ Construction and repairs of steamers and boats - - - - -	1,000
„ Establishments - - - - -	1,449
Total - - - £.	15,783

31. In

	£.
* Viz.: Stonework in the bed for confining the stream within proper limits -	160,000
Storing water - - - - -	200,000
TOTAL - - - £.	360,000

† Neither estimate had much pretension to accuracy; the second was merely a rough approximation. The total cost of rendering the river navigable all the year round was thus estimated at 660,000 £.

‡ This work was proposed, and estimated for, by Colonel F. C. Cotton, in 1854. The object was to facilitate the passage of steamers over the barriers in the Monsoon. It was carried out in 1855, but without effecting any material improvement in the navigation. It formed no part of the Monsoon navigation project which was subsequently brought forward.

§ In 1857, no funds being available for the Monsoon navigation scheme, an attempt was made to render the first barrier passable for boats, by means of locks constructed in the river bed. The rocks were built, but, no further operations having taken place during the two following years, they remained unused, and some blasting and cleaning away of rock, which was required to render them effective, was never executed.

|| In 1860 a small sum was granted by the Madras Government for the purpose of keeping open navigable channels through the shoals in the river below the first barrier, with a view of facilitating the working of the steamers which were then engaged in carrying up military stores for the troops at Nagpore. The means used were groins of a temporary construction, called “bandals,” made of bamboos and grass, and their operation was very successful. Up to the 5th February, or the beginning of the eighth month of navigation, a minimum depth of three feet was maintained in all the shoals between the Sebbry and Dowlaiswaram Anicut.

31. In the latter part of 1860, sanction was given by the Government of India for an expenditure of two lacs, in the official year 1860-61, on the works proposed, in the Monsoon navigation project, for the first barrier.

Operations were commenced in the beginning of 1861, and at the close of the official year, 5,490*l.* had been expended on works chiefly of a preparatory nature.

32. In April or May of that year an important proposition was brought forward. It was urged (1), that the budget allotment for the following year being only 20,000*l.*, the prosecution of the works on annual grants of this amount must be a tedious operation, the conclusion of which could only be looked forward to at the end of 10 or 15 years; (2), the open parts of the river between the barriers being navigable, the substitution of portages, as a temporary measure, at the barriers, for the locks and canals of the Monsoon navigation project, would render navigation practicable from the Nagpore country to the coast; (3), that the works required for such portages, viz., roads or tramroads, might be made of simple and cheap construction in the course of a year or two, for a small part of what the permanent works in the river-bed would cost; and (4), that the application of the available funds to this purpose, in lieu of that for which they were originally intended, would yield immediate results; would bring the river into immediate use, and so, it might be hoped, commence a traffic which, by the time the permanent works should have been completed, might be expected to have become important and remunerative; (5), that the river having thus been brought into operation, the locks and canals at the three barriers might be proceeded with, and prosecuted as rapidly as the available funds might permit.

This proposition received the approval of the Madras Government. A light tramway was ordered to be constructed with the least possible delay round each of the barriers, and two steamers (there being in all about six available) were placed in each of the navigable reaches of the river. It was intended that as soon as these preparations should be completed, the line should be opened for use, a special agency being organised for managing the transport of goods and passengers, which would then be effected by means of steamers in the navigable reaches of the river, and by tramways at the barriers.

33. In June 1861, the navigation works which had been commenced at the first barrier were ordered to be stopped, and the allotment for the year to be devoted to the construction of the tramroads.

34. By the close of the year, 30th April 1862, the progress made was as follows:—

At the first barrier, the tramway, 19 miles in length, was about half finished.

At the second barrier, the earthwork and ballasting of the line, 18 miles in length, was nearly completed, and the greater part of the rails and sleepers laid.

At the third barrier, three-fourths of the earthwork and a portion of the ballasting, of a line 33 miles in length, was done.

At all three points temporary sheds for the reception of goods were erected, and the arrangements generally were in such a state of forwardness that in May 1862, the Madras Government ordered the line to be opened for traffic. The transport at the three barriers was to be effected by means of common carts, pending the completion of the tramroads. Public notice was given accordingly in the various district gazettes, and in June navigation was commenced. The transhipments at the barriers were only effected with extreme difficulty, owing to the badness of the roads over which the goods had to be carried. The steamers also were ill-adapted to the navigation, being mostly of small size, originally intended for still-water canal navigation. Nevertheless, 1,290 tons of goods and 3,000 passengers were carried during the season, including about 1,000 bales of cotton from Chanda (the chief town in the southern part of the cotton country) to Cocanada. The result, considering the difficulties under which the transit was accomplished, was highly satisfactory, and justified fully the expectation that, with better steamers and properly-equipped roads at the barriers, a safe and remunerative traffic of considerable amount might be obtained.

35. On 1st May 1863, the whole of the works of the Godavery were placed under the Central Provinces Administration. The expenditure, under all heads, up to this date, from 1st May 1861, viz., in the previous two years, was 92,876*l.*, or from date of the commencement of operations in January 1861, 98,366*l.* In addition to this there was a

	£.	
in 1861 to 30 April -	5,490	sum of 37,403 <i>l.</i> , being the amount of unadjusted advances for labour
1-62 - - - -	36,179	and materials, and of sums expended in the purchase and repairs of
2-63 - - - -	56,697	steamers, boats, machinery, tools, &c., which had not, up to the close of
Supplemental Account -	37,403	the year, been exhibited in the accounts, under the several heads of
		work to which it was chargeable. A supplemental account for this was
TOTAL - -	£. 135,769	submitted, making the total expenditure from the commencement of
		operations in 1861, 135,769 <i>l.</i>

Of this amount the principal items were,—

	£.
Expenditure on annicut and canal at first barrier - - -	39,342
Expenditure on tramroads - - - - -	37,570
Expenditure purchase of plant - - - - -	31,611
Expenditure on improvements in river bed between first barrier and the coast* - - - - -	5,259
Expenditure on establishments - - - - -	17,490

36. This statement shows that up to May 1863, not half the expenditure that had taken place was incurred on account of first barrier works. These works forming part of the Monsoon Navigation Project, had received much less attention than the tramroads. The prosecution of the original scheme (the Monsoon Navigation Project) had, in fact, up to that time been subordinated to that of the *altogether distinct and independent* scheme for opening immediate navigation by means of land transport at the barriers. The larger and more important scheme was, indeed, for a time suspended altogether, and throughout was only carried on in subordination to the lesser, the completion of which was made, by the orders of the Madras Government, the primary object of the engineers. It is important to notice this point, because it shows that much of the disappointment which has been felt at the small progress made with the navigation works, in comparison with the expenditure incurred, is groundless. The Government of India is evidently under a misapprehension upon the subject, owing to want of information, attributable, I think, chiefly to the repeated changes which have taken place in the jurisdiction under which the works have been conducted, and in the *personnel* of the different administrations through whose hands the correspondence has passed.† The facts are—

1st. The project for the Monsoon Navigation Works was submitted to Government in 1856.

2nd. No operations in furtherance of it were commenced until January 1861.

3rd. During the next two and-a-half years the works were in great part kept in abeyance, the principal operations being those for a separate and independent scheme.

4th. The expenditure in labour, materials, &c., during this period, including all preparatory works for the clearance of jungle, housing of workpeople and establishments, and erection of workshops, stores, and hospital buildings, was only 39,342 l.

37. On the transfer of the works to the Central Provinces the tramroad scheme was abandoned, the Chief Commissioner disapproving of it, and the Government of India endorsing his views. The work already done at the second and third barriers was, therefore, left incomplete, and the money expended upon it must be regarded as in great part lost. The tramroad at the first barrier being of use for the transport of stores, materials, and food from point to point of the line of canal under execution, was completed, and has been of much use.

From that date, viz., 1st May 1863, to the present time, the constructive operations have been chiefly confined to the Monsoon Navigation Works at the first barrier, and the expenditure in the two following years (to 1st May 1865) has been 134,513 l.

38. During

* It has been mentioned above that the operations undertaken in 1860, for deepening the channels through the shoals, had proved successful. In 1861 improvements of a more permanent character were effected. A good deal of rock which obstructed the stream at certain points was removed, and three groins of stone for confining the stream to a channel of proper width were commenced. One only of these, 600 yards in length, at the confluence of the Sebbry, was completed, though not to the full length required. Its operation has been most satisfactory. There was a shoal at this point which was, without exception, the worst known on the river. Little or no success had attended the use of the "bandals," and it proved the most formidable obstruction to the dry weather navigation between the first barrier and the coast. Since the construction of the groin this shoal has almost entirely disappeared, and only the extension of the groin to its proper length is required for the complete extirpation of this serious obstruction.

The successful operation of this work is, in fact, the most important result of all since the commencement of the navigation works, from the direct proof which it affords of the possibility of so removing the natural defects of the *sandy* bed of the river as to allow of navigation by steamers of good draught during the dry months.

† Those changes have been great since 1st January 1861. The works commenced under Sir Charles Trevelyan continued under Sir H. Ward, then under Sir W. Denison, and finally were transferred to the Central Provinces under the administration of Mr. Temple, and for a few months past of Mr. Campbell. During the same short period there have been three Governors-General, Lord Canning, Lord Elgin, and Sir J. Lawrence. In the office of Deputy Chief Engineer, Chief Engineer, and Secretary to Government, the following succession of officers took place during the period referred to: at Madras, Colonels Boileau, Rundall, Ludlow, Horsley, Birdwood; at Nagpore, Colonels Impey, Dickens, Maxwell; at Calcutta, Colonels Dickens, Strachey, Dickens. Considerable diversities of opinion in the controlling authorities, and changes of plans in the direction of the works, could not but result from such changes, while it could scarcely have been possible for each incumbent to transmit to his successor a clear idea of the history, nature, and condition of the works. Add to this that the engineers and their office establishments had to conduct their duties amid interruptions arising from frequent attacks of fever, to which not a few of the natives and some of the Europeans finally succumbed; and that in the transfer of the works to the Central Provinces a total change in the system of accounts and in the organisation of the establishments took place; and it can scarcely be surprising that the officer who finally took up the long and tangled thread of correspondence in 1865 should find himself in ignorance of some points connected with the subject, or that the officer who had continued from the first in immediate charge of the works should fail fully to appreciate, as it was desirable that he should do, the need of information felt by his superior at Calcutta.

£.
Exploring Expedition of 1861-62, 693
Survey of the Wurda in 1863 - 71
Drainage and clearing of Station
at First Barrier - - - 331
Preparatory Works: as surveys,
clearing, &c., at Second Barrier, 745

38. During the period above passed under review, a further expenditure took place on minor works, as noted in the margin.*

39. As I have not now the means of analyzing the expenditure of the last two years I here give the total expenditure under all heads on the Godavery, from 1855 up to 1st May 1865, as stated by the Government of India, viz., 286,075 £. Of this sum the amount debitable to the works embraced the estimates for the Monsoon Navigation Project is 201,295 £,† viz.:

	£.
First barrier works - - - - -	85,867
Second barrier works - - - - -	9,878
Improvements in river bed - - - - -	6,001
Establishments - - - - -	40,055
Stock, steamers, boats, and machinery; materials and unadjusted advances - - - - -	59,494
Total - - - £.	201,295

40. A brief description must now be given of the works originally proposed for each of the three barriers. These were, at the first barrier, a weir, with lateral canal, 24 miles long, and locks to complete the communication; at the second barrier, a weir, with locks in the river bed; at the third barrier, a weir, with thirty-two miles of canal, and locks.

41. It will be understood from what has already been said that work has only been commenced at two of the barriers—the first and second. At the latter, however, the operations have been trifling, and merely of a preparatory nature; such as the cleaning of station, building houses, and purchase of machinery.

42. At the first barrier a considerable expenditure has already taken place. The works at this point have been carried out hitherto on the original design, with the exception of some unimportant modifications introduced to diminish expense. It is estimated by the Government of India that 40,000 £. more, which has already been provided for in the current year's budget, will be required to complete the works so far as to open navigation past that barrier for four or five months in the year; and the expenditure of perhaps 2,000 £. more, in still further clearing and deepening the channel through the rocky part of the bed below the barrier, will extend this period to at least six or seven months for steamers, and to the whole year for boats.‡

43. Estimates have been submitted, and generally approved of by the Government of India, for the works required for the second barrier. The amount is 113,413 £.; but the Government of India think it better to allow for a probable expenditure of 130,000 £. The completion of these works would open the navigation to the foot of the third barrier, or to a distance of 309 miles from the sea.

44. The

* These operations were as follows: (1.) Previous to 1861 no steamer had ever ascended the river further than the second barrier. In this year two steamers were taken over that barrier and placed in the reach above it; and a third was taken over the third barrier in a flood, an operation of great difficulty and danger, very ably performed by Mr. De Groussillier, Assistant Engineer, and Mr. Farley. (2.) The Wurda from the third barrier to Hingenghat was surveyed and mapped, and the levels of its bed accurately ascertained. (3.) The clearing of jungle and drainage of the station of Dumagudiem at the first barrier was partly effected. (4.) The surveys and levels required for the preparation of the estimates for the second barrier works were completed, and the ground for a station partly cleared.

† This estimate did not include the cost of the survey of the river which preceded it (6,000 £.), nor of the work done in 1855 on a previous estimate of Colonel F. Cotton's, with which it had no connexion (5,700 £.); 11,700 £. is therefore deducted on these accounts; 3,300 £. on account of the other works noted in paragraph 30, which also were not included in the Monsoon Navigation Project; and 69,780 £. (including establishments) for the tramroads.

‡ The works here referred to are the Head Works (Auncut and Entrance Lock) and two miles of canal, with locks to connect with the river below. The complete scheme, as estimated for in the original project, consists of the same Head Works, with 24 miles of canal and locks. In 1863 it was proposed to reduce the expenditure at the first barrier as much as possible, and to apply the saving to the prosecution of the works at the second and third barriers, which up to that time had not been commenced from want of funds. For this purpose it was proposed to complete, in the first instance, only two miles of the canal, and to connect it with the river by an additional set of locks, and to postpone the completion of the remaining 22 miles until the works at the upper barriers should have been finished. The proposal was not favourably received by the Government at the time, but has now been approved.

I have not thought it necessary here to complicate the calculations by any addition to the estimate on account of the work thus postponed, because it may be found that the smaller scheme will afford as good navigation as may be required for several years. See, however, on this subject further on.

44. The probable cost, then, of *so much* of the Monsoon Navigation Scheme may now be stated with confidence; thus:

	£.
Already expended, as above - - - - -	201,295
Estimated cost of second barrier works* - - - - -	130,000
	£.
Amount required to complete first barrier* - - - - -	40,000
Add for extra clearance of rock in bed below barrier - - - - -	2,000
	42,000
Establishments:*	
First barrier - - - - -	15,000
Second barrier - - - - -	43,330
	58,330
Total for works at first and second barriers, and for improvements already effected in river bed below first barrier - - - - -	431,625
Add for clearing a passage through rocks at two places in river bed between first barrier and second barrier (rough estimate) - - - - -	2,000
Total for all works required to open navigation to third barrier, 309 miles from the sea - - - - -	433,625

45. Of this amount, 201,295 £. has already been expended, and 55,000 £. has been provided for in this year's budget. Thus the total amount yet to be provided from the public treasury will be 177,330 £.

The result of this expenditure will be as follows:

The Godavery and Pranhita will be rendered navigable to a distance from the sea of - - - - -	309 miles.†
The main Godavery will also be available for navigation, above the confluence of the Pranhita, for a further distance of - - - - -	80 miles.‡
TOTAL length of Navigation - - - - -	389

The cost therefore will be $\frac{433625}{389}$ or 1,115 £. per mile.

As more than half the expenditure required for this purpose has been already incurred, and the estimate of the remainder is that of the Government of India, based on detailed estimates already submitted, including every item for contingencies and establishments, and with an addition of 30 per cent. to the estimate rates for work, there seems no reason to doubt that the cost of opening the above length of river will not exceed the amount stated.

46. In now estimating the probable cost of the remaining works required for carrying navigation up to Hingenghat, which was the extent contemplated in the original scheme, it must be premised that we have no longer detailed estimates on which to base our calculations. But let it not therefore be supposed that we enter the region of mere speculation. The data we actually possess are sufficient to determine the essential points of the question; and for the estimates which I shall now give I venture to claim a higher title to confidence than is due to those of the Government of India for the road which has been projected as a substitute for the river, and which, as I have above shown, there are the strongest reasons to distrust. My estimates are based on surveys and levels actually made; those of the Government of India rest only upon the known average cost of a road in the Central Provinces, which I have shown cannot at all apply to such a purely exceptional case as that of a road down the Godavery, the very line of which is undetermined, and for which not a single level has been taken, or even a *reconnaissance* made. If, then, the question has been argued by the Government of India on such an assumption as this, I trust that due weight will be allowed to my arguments on

* As estimated by the Government of India.

† The distance by canal from Dowlaisaram to Cocanada, 32 miles, is included in this, but, on the other hand, the calculation does not include 27 miles of the Sebbry and about eight of the Indrawutty, which will also be rendered navigable. The Sebbry, for this distance, has been in use for some years, though as yet only for four months, some rock requiring to be cleared away a few miles above the mouth.

‡ The main Godavery is quite free from any obstruction to a distance of 80 miles (to Dermapoory) above the confluence of the Pranhita. I have myself ascended it, in a steamer drawing two feet, to a distance of 50 miles, in the middle of October.

criticism, and in the absence of any other shall assume that it is approximately correct.

51. The effect of these works may be described in one sentence. They would make a deep, still-water navigation, extending from the foot of the Third Barrier to Bullarpoor, six miles from Chanda, a distance of 73 miles. This length of river and canal would be *navigable at all times of the year*. The canal would, of course, be so, and the 40 miles of river above its head, having a fall of only 20 feet, would become a still-water pool also, by the construction of a weir of that height at that point.

52. Now, it is for this length of navigation, estimated to cost 131,900 *l.* that it has been proposed to substitute a common road, estimated to cost 75,000 *l.* And the relative value of the two routes, and the effect upon the whole line of navigation of the one to which the preference has been given—the road—is shown by the original proposer thus;

Cost of carriage from Chanda to Cocanada, by river, at 4 pice per ton per mile, 384 miles - - - - - 8 rupees.

[illegible]

In other words, the substitution of this one piece of road for the river would increase the cost of export, by this route, *threefold*.

If this simple calculation, which, I repeat, is not mine, is not sufficient to condemn the whole scheme of a road, I know not what argument I could use that would be more effectual. I will, therefore, transfer to foot notes (a) some of the arguments I advanced in my Report of 16th November, 1863, and merely observe here that, if the effect of the introduction of this road, as a link in the communication, is to be so disastrous, the counter scheme, which is estimated to cost so little more, and which would afford 73 miles of the best and cheapest navigation upon the whole line, is, at least worthy of examination. If

(a) "Now if Moyellee^o be made the head of navigation, only a corner of the important tract of country thus indicated will be effected by the improvement, or derive any benefit from it. In this case the cost of the land transport will be such an enormous addition to that of the water line that, as the Chief Commissioners shows, the river will attract no traffic from any point further north than Hingenghat. In other words, the limits of the trade basin in that direction may be described from Moyellee as a centre with a radius of 115 miles, instead of with one of 230 miles, were Hingenghat the terminus, or with one of nearly 300 miles if a little canal communication were opened northwards in connexion with the river. It needs but a cursory examination of the map to show what an immense extent of some of the most valuable and productive country in Central India will thus be lost to the river, contributing nothing to its traffic, and being itself deprived of the benefits of the communication. The trade basin north of the Third Barrier would in fact be only one-fourth or one-fifth in this case what it would be in the other, and thus by far the greater part of the very country which of all others it should be our object to reach, would be shut out altogether from the river and its port.

* Moyellee is at the foot of the Third Barrier.

"But let us glance for a moment at the extent to which the proposed curtailment of the original project is likely to affect even the limited portion of the Wurdah and Wyne Gunga valleys which it would reach.

“The Chief Commissioner shows that the cost of carriage to Cocanada from Hingenghat by water alone might be *Rs. 6. 15. 3.* per ton, while from the same point to the Third Barrier by land and thence to Cocanada by river, the cost would be *Rs. 26. 6. 3.* This is to say that the intervention of this one piece of land carriage would increase the cost of transport *fourfold.* To what extent is that likely to operate upon the traffic?—Take any line of transit in India, or the world, and increase the rates of transport in this proportion, and the effect would be, in most cases, annihilation of the traffic, or *decrease* them in the same ratio, and the increase may be not four, or five, or tenfold, but twentyfold.”

"But the injurious effect of such a restriction of the scheme will be more apparent if we notice more in detail its effect on one or two of the commonest articles of trade. Let us take, for instance, salt, in which there is every prospect of there being a highly important traffic.

"The cost of carriage to Hingenghat by the two routes would be—

By river only - - - - -	<i>Rs. a. p.</i> 11 9 5 per ton.
By land and river - - - - -	29 9 9
Difference per Ton - -	18 0 0

† See the Chief Commissioner's Report.

“ Now 18 rupees per ton is *Re.* 0. 10. 8. per maund. Thus the increased cost of carriage would be equivalent to an extra import duty of *Re.* 0. 10. 8 per maund. Either this would operate as a most serious check upon consumption, and so upon the revenue from salt, or if this be not admitted, a river toll of this amount might be levied upon all salt imported by the river without checking consumption, supposing navigation to be practicable to Hingenghat ; and as the Chief Commissioner is of opinion that with the river so improved, Nagpore Proper would derive the whole of its present supply of salt, 200,000 maunds, by the river from the Eastern Coast, the revenue from this toll alone would amount to 1½ lacs, representing a capital of 27 lacs, which therefore it would on this ground alone be worth while to spend on works above the Third Barrier.

"Or let us take an export, such as oil-seeds, an article for which there is an ever increasing demand at Cocanada.

"The cost of carriage from Hingenghat by the two routes would be—

By water only - - - - -	Rs. 6 15 3 ¹ / ₂
By water and land - - - - -	26 6 3
Difference per Ton - - -	19 7 0

‡ Vide Chief Commissioner's Report.

or *Re.* 1. 8. per bag of two maunds.

"Now eight annas per bag is usually reckoned by the Cocanda merchants a fair profit upon this article, that is to say, that, when they can clear this amount, the trade is sufficiently remunerative. Hence it appears

it is worth while to expend 1,115 £. per mile on the river below, to bring the navigation up to the foot of the Third Barrier, surely it is worth while to spend 1,718 £. per mile on the next 73 miles, which would extend the navigation into the most populous and wealthy part of the Godavery Valley, rather than make a road at 1,000 £. per mile, the extra cost of carriage by which would be equivalent to the imposition of a frontier duty of 20 rupees a ton on the export and import trade of that part of the Valley which, while from its natural advantages likely to have the greatest traffic with the coast, can, in consequence of its distance from the sea, least bear a high cost of transit.

I cannot think it can be necessary to say more upon this question. I shall be satisfied if what has been advanced shall be held to show the necessity for a thorough examination of the project for the Third Barrier.

53. But we have hitherto considered the effect of the proposed weir at the head of the Third Barrier upon the first 40 miles only of the river above. We have seen that this much of the river, viz., from Ballarpoor, the port of Chanda, downwards, will be *navigable at all times of the year*; it will, in fact be "canalised." We have now to consider the use that may be made of the river above, 60 miles in length, up to the neighbourhood of Hingenghat, the principle cotton mart of Nagpore. This piece of the river has a fall of 1.4 foot per mile, and is eminently adapted for navigation, if a sufficient depth can be maintained. It is in this respect that it is defective in its natural condition. For such steamers as we now have upon the river, drawing two feet of water, there is sufficient depth in this river for navigation during three months only, and even during that time there are occasional interruptions when this depth is not maintained; that is to say, *so far as we yet know the river*. But here our information is defective, and this is just another part of the case in which I venture to submit that much has been assumed as proved adverse to the river scheme, where really *more investigation* was needed to establish the facts. A steamer drawing fully two feet of water was placed upon the Wurda, and during the season of 1862, when the transit operations were in progress, plied between the Third Barrier and Chanda. It was found, as above described, that for such a vessel navigation could not be maintained uninterruptedly, for even three months, in that part of the river; but that is much the broadest part of the river, and the shoals might well be more formidable there than some distance higher up. In 1862 I ascended the river in the same steamer to near Hingenghat, in September, and returned without difficulty. Several points have, therefore, to be established before the original proposal to use this part of the river for navigation can be abandoned.

1st. It must be ascertained for what length of time it is navigable by vessels of two feet draught in its natural condition.

2nd. Inasmuch as from its gentle fall, and narrow width, it is pre-eminently adapted to improvement, it should be ascertained how far the natural period of navigation may be extended by means of such works as wing dams, groins, and training walls, which have been used with advantage on other rivers for the purpose of restraining the eccentricities of stream, and confining it to a narrowed channel at the shallows.

3rd. It should be ascertained to what extent boat navigation, by sail and tracking, is practicable. It certainly is so for a longer time than a steamer could run, and the narrowness of the channel renders it especially adapted to this kind of navigation, which is always as cheap as steam. If boats can ply in this manner between Hingenghat and Chanda, and can be taken in tow there by tug steamers, a great part of the value of the river may be realised.

4th. Steamers drawing only one foot of water can now be constructed and put upon this river. I myself built one with a draught of one and a quarter foot, of wood, which is now running below the First Barrier. It should be ascertained how much longer vessels of such draught could ply than those of two feet draught, either in the natural state of the river, or with its channel rectified as above suggested.

5th. It may very possibly be found, on examination, that, with the aid of some improvement of the bed, as above suggested, vessels of this light draught might work for some months.

6th. It is certain that the quantity of water required to supplement the natural flow of the stream to a degree sufficient to afford navigation for such light draught vessels would be very small, and might be stored in the hills, west of Nagpore. This part of the river is peculiarly adapted to this mode of improvement. It is not more than three times the width of the Ganges Canal, its slope is considerably less, and one-fourth of the depth in the canal would be sufficient. In point of fact, however, at the few shoals where increased depth is needed the width of the stream would not be *half* this amount, as the water would not be permitted to spread over the whole width of the bed. There can be

appears that the above difference in the cost of carriage is *three times greater than what would suffice to stop the export of oil-seeds altogether*, and it must be remembered that, in the production of this article, at least Nagpore has an important rival in the rich and highly irrigated tracts lying along the coast where almost every village has direct communication by canal with the port."

"It thus appears that, by carrying the navigation no further inland than the Third Barrier, we should fail to relieve so important an article as salt of a tax which must tell seriously upon its consumption, and leave the cost of transport so high that comparatively trifling fluctuations in price at the port may completely stop the export of some of the commonest staples. Is this to be the state in which the opening of the Godavery is to leave Nagpore?"

be no question, therefore, of the applicability of the reservoir system in this case, and there is strong probability that the quantity of water to be thus stored will be found to be very small.

54. Putting all these considerations together, it must, I think, be admitted that the Wurda from Chanda to Hingenghat is eminently capable of adaptation to the purpose of navigation, and that there is at least a probability that the works required for the purpose may be found to be far less expensive than those proposed for any part of the rivers below. Under such circumstance a thorough investigation of the case is plainly necessary, for if the navigation can thus be continued up to Hingenghat, 60 miles further into the Nagpore Valley than Chanda, a great diminution of the cost of export and import will be effected, and the benefits of the communication more widely extended.

55. I have already contrasted the cost of carriage from Chanda to Cocanada by water, with that by road and water. A similar comparison may be made for Hingenghat. The several cases would stand thus :

From Chanda to Cocanada by road and river (as above)	-	24½ rupees.
From ditto to ditto, by river	-	8 "
From Hingenghat to Cocanada by road to Chanda, and thence by water, 58 miles at 3 annas, and 382 miles at 4 pice	-	19 "
From Hingenghat to Cocanada by river, 467 miles at 4 pice	-	10 "
From Hingenghat to Cocanada, by road to foot of Third Barrier, and thence by water	-	31½ "

Now, the great value of the river carriage consists in its *cheapness*, and the radical objection to these substitutions of road for river is that by their means this essential advantage is lost; the value of the river is immensely reduced. For what must be the effect on the traffic of any such enhancement of rates as the introduction of roads would cause? If the cost of export and import is thereby doubled only, the traffic must be diminished in a very much higher degree; probably it would sink to a tenth at most of what it would otherwise be, and the loss to the country would be incalculable, while, of course, there would be a proportionate diminution of the returns from tolls on the whole of the expenditure on the 309 miles of river below the Third Barrier. It seems, therefore, clear that in no account whatever should land carriage be substituted for water in any part of the line until a full inquiry has shown that the river cannot be made use of for navigation, or could only be so at an altogether disproportionate cost.

56. With regard, then, to the river generally above the Third Barrier, there can be no question that it may be used for navigation up to Hingenghat, and if for the 60 miles of it above Chanda it be admitted that at present we are not in a position to determine *precisely* what works should be undertaken for its improvement, it will probably be granted that a clear case exists for full inquiry into this question. With regard, however, to the river below Chanda, from the town to the foot of the Third Barrier, let it be distinctly noted that no such uncertainty exists. The practicability and effect of the works proposed for this part is unquestionable. The levels which have been repeatedly taken, and are now thoroughly established, leave not a doubt as to the effect of such works as above proposed. They would form a *continuous canal navigation for 73 miles*, available without interruption at all times of the year. As to their cost, I shall for the present assume the probable correctness of the approximate estimate above given, amounting to 131,900 £, or including establishments (at 33 per cent.), 175,860 £.

57. We may now review the cost of the whole scheme, which will stand thus :

	£.
Cost of works below Third Barrier as already described	433,625
Cost of works at Third Barrier	175,860
Add for cost of original survey of 1855	6,000
Total for all Works up to Chanda, 382 miles from the sea	615,485
If the works required for 60 miles of the Wurda above Chanda cost 1,000 £. per mile, we should then have for the whole cost of opening the river from the Port to Hingenghat, 442 miles	675,485

The total length of river which would thus become available would be :

Cocanada to Hingenghat	-	-	-	-	-	442 miles.
Other tributaries (deducting for length of Cocanada canal)					80	"
TOTAL	-	-	-	-	522	"

and the cost per mile would be 1,300 £.

58. Of the total amount required, 256,295 £. has already been expended, and 419,190 £. would yet be required to complete the works.

59. Thus

59. Thus, in four or four and a half years, with an annual allotment of 100,000 l. the whole line might be opened for traffic.*

DURATION OF ANNUAL PERIOD OF NAVIGATION.

60. Now, what would be the effect of this expenditure in regard to the *time* during which the river would be available for navigation? This is an important point, and has been reserved for special notice here.

61. In the first place it must be admitted that the expectations originally held out upon this point have not been fully confirmed by subsequent experience. The actual navigation of the river towards the close of the monsoon season was not commenced until some years after the original survey was made, and was then confined only to the part below the first barrier. It was not till 1861 and 1862 that steamers were placed on the upper parts of the river, and that the state of the navigation was ascertained by actual trial.

62. It will be well to state here precisely what is now known upon this subject, and for what time navigation has been found to be practicable, by the steamers now on the river, during the past three or four years. All these steamers draw at least two feet of water. It would, perhaps, be more accurate to say two and a quarter feet, allowing for some "sagging" amidships. One or two draw as much as two and a half and three feet.

In the reach below the first barrier, then, such steamers work for eight months, meeting occasionally during the latter part of that time with detentions at the shoals, which, however, are not more than three or four in number. Steamers have worked to a later period, but the obstructions at the shoals usually limit their effective use to about the time mentioned.

Between the first and second barriers the shoals have not been the cause which has limited the time of navigation, but some reefs of rock which lie about halfway between the barriers, and which, though removable at a trifling cost, have been suffered hitherto to prevent navigation for a part of the time during which it would otherwise be practicable. Usually the passage through these rocks has not been safe after the middle or end of October. Nevertheless, I myself ascended this part of the river in December 1863, forcing a passage through the rocks, and met with but one shoal in the whole distance which caused detention, and this lay immediately below, and was caused by, a cluster of rocks at one of the places referred to. This was in the middle of the sixth month of navigation. I made a special report upon the subject at the time, deeming the fact thus practically ascertained, of there being perfectly good navigation for vessels of two and a quarter feet draught, in the sixth month, of great importance.

Above the second barrier two steamers of the above draught were stationed in 1861, and worked for about four months in 1862. The transit operations, however, having been stopped, these steamers were subsequently brought down to the first barrier. My impression is that between the second and third barrier steamers drawing two feet would meet with great difficulties in the fifth month, and with occasional detentions in the fourth.

Above the third barrier, as I have already stated, steamers of this class can only ply between the barrier and Chanda during three or three and a half months, and not continuously for that time, the stream occasionally falling too low for a passage at the shoals. I ascended the river in a steamer nearly to Hingenghat, in September 1862, and returned without hindrance, but a fortnight before this might have been impracticable.

In all these reaches boats, worked by sail and pole, can of course ply longer than steamers of the same draught; it may safely be said fully a month longer.

63. It

* This closely agrees with the estimate given in my Report of 16th November 1853, in which the plans proposed were essentially the same as those now advocated:

	Lacs.
First Barrier Works (to complete)	3
Second - - ditto	10½
Third - - ditto	13
Reservoir	2
Clearance of Rocks	1
TOTAL	29½

"Now if 10 lacs a year could be given for three years, the river might be opened to this extent (*viz.*, to Hingenghat) in that time."

This estimate does not include establishments. That forms, in all cases, a separate head of charge, and, as a rule, is not included in the estimates. If the charge for this be added at 33 per cent. the total approximates closely to the amount above given. It is satisfactory to find that the views then advocated have now, in regard at least to all the works below the Third Barrier, the concurrence of the Government of India; but if want of information has prevented the Government coming to an earlier decision, I cannot but regret that my strongly-urged request, in March 1864, for permission to proceed to Calcutta, and there give in person any further explanations that might be required, was not granted.

63. It may be said, then, that were the obstruction caused by a few rocks in the open reaches of the river removed, the river would be navigable by vessels of two feet draught.

From the sea to first barrier for	-	-	-	-	-	8 months.
Between first and second barrier for	-	-	-	-	-	7 "
Between second and third barrier for	-	-	-	-	-	5 "
From third barrier to Chanda	-	-	-	-	-	12 "
From Chanda to Hingenghat	-	-	-	-	-	3 "

Occasional detentions at the shoals would be met with in the latter part of the season, but as the removal of the rocks which here and there obstruct the passage would, at the same time, in many instances remove the shoals, these detentions would not be so frequent as hitherto.

64. Such would be the capability of the river for navigation, by vessels of two feet draught, were the works at the barriers completed, and a few rocks removed in the reaches between.

Were the draught of the steamers reduced to 18 inches, I believe that the navigation of the river for the periods above mentioned would be almost unobstructed, and practicable for a month longer in each case.*

65. But the most important point in connection with this subject is, that we are now no longer limited to a draught even of 18 inches. During the eight or nine years past great advances have been made in all departments of manufacture connected with iron shipbuilding, and the blockade running of the late American war has especially directed attention to the subject of light-draught steamers. Steel, or "steely iron," can now be used freely in the construction of such vessels, and steamers may now be placed on the Godavery with a draught of 12 and 15 inches. I did, in fact, build one of 15 inches draught, of wood, in 1861, which has proved most serviceable, though from one of the boilers having sustained an injury in the passage out from England, the full power of the engines has never been obtained, and the speed is limited to seven miles an hour. With my letter of 24th August 1864, I submitted a specification, by Messrs. Blyth, of London, for an iron steamer of 120 I. H. P., with a draught of 14 inches; and I now append a similar specification by Messrs. Maudslay, Field, and Sons, for a steamer of larger size, suited to the dimensions of the locks now under construction at the first barrier, with 240 I. H. P., and a draught of 12 inches.

It is evident, therefore, that the facilities for the navigation of shallow rivers are now immensely increased. We are, in fact, now in a position to say, without hesitation, that *all*, and more than all, the expectations originally entertained as to the *time* during which the Godavery may be navigated, may now be realised. It was stated in my first report of May 1856, that if the barriers were rendered passable, the river would be navigable for eight or nine months. It is a satisfaction to me to be able to state now, with confidence, that the river may be navigated to Chanda for nine months; and I believe that even that is not the limit as to time, but that with the aid of some such temporary construction at the shoals as were found to be successful on the lower part of the river in 1860, the period of navigation may be extended to *the whole year*.

66. I do not consider that this fact, important as it is, diminishes the necessity for the works of a permanent character which have been proposed for deepening the channels through the shoals. Navigation for the time mentioned will be practicable even without such works; but it will not be so *cheap* as may be obtained by the use of steamers and boats of greater draught, and as *cheapness* of transport is the one great object of the whole undertaking, the permanent works at the shoals, which will afford material improvement in this respect, at a comparatively small additional expense, should undoubtedly be constructed.

The cost of such works, viz., groins and training walls of loose stone, has been roughly estimated at 35,000 £, or, including establishments, 46,000 £. It was recommended in my letter of 16th November 1863, that the surveys and estimates for these works should be put in hand at once, but I am not aware that this has been done.

67. It will be well, however, before passing on, to correct an erroneous impression which may not be uncommon with regard to the *extent* of the shoals. It is quite a mistake to suppose that when the river is said to be so low that vessels of two feet draught cannot run,

* In writing upon this subject hitherto, that is, since 1861, when we first commenced the navigation of the upper parts of the river, I have been accustomed to speak of the river as navigable for four or five months, referring to the whole length of it below the third barrier. I had received no orders to lead me to suppose that any greater precision was necessary. The Government of India having expressed, in the most decided terms, their conviction of the sufficiency of a four or five months' navigation for all the wants of the country for many years to come, I had no idea that the shortness of the period of navigation would afterwards be urged as a reason for abandoning the scheme. I had reported, at considerable length, to the Madras Government on the shoal navigation, and especially with reference to the success of the work at the confluence of the Sebry, above referred to, and had I supposed that the Government of India entertained doubts upon the subject, and needed more detailed information, I should have given the details above mentioned. I cannot but here again express my regret that I was not summoned to Calcutta in 1864, as I requested. Personal conferences upon such subjects remove many misconceptions.

run, *the whole length of it is as shallow as this.* The fact is that the shoals are confined to a very few points, in all about 15, between Chanda and the sea, and their total length is not more than 12 miles out of 382. The remaining 370 miles are either artificial canal, or (which is the case with the greater part) long deep pools, or narrow and well-defined channel. It will be understood from this what a trifling portion of the whole length of the river presents any difficulties to navigation.

68. Let me also here again state that the worst known shoal on the river, that at the confluence of the Sebbry, has been so completely removed by the construction of a groin that no doubt can now exist as to the practicability of this method of improvement.

69. To sum up, then, what has been said upon this part of the subject, it may be stated in general terms (1) that if the works above proposed for the three barriers are carried out, and the other parts of the river bed cleared of the few rocks which obstruct the channel, the river will be navigable by steamers and boats of light draught from the sea to Chanda for the greater part of the year, and very probably to Hingenghat for four months; and (2) that the navigation from Hingenghat to the sea may be rendered practicable for such light-draught vessels for the whole year at a small additional expense.

The probable cost would be:

£.

- | | | |
|---|---|----------|
| 1st. For a nine or ten months' navigation, from the sea to Chanda - | - | 615,485. |
| 2nd. For the same to Hingenghat - | - | 675,485. |

If the cost of the stonework in the bed above proposed for the improvement of the shoals be added, the effect of which would be to render the river navigable for at least six months by vessels of two feet draught; or if we may judge by the effect of the groin already constructed at the confluence of the Sebbry, for *eight or nine* months, the total for the navigation from Hingenghat to the sea would amount to 721,485 *l.*

70. The cost of the altered project, partly road and partly river, to which the Government of India is inclined to give the preference, is thus stated in their Proceedings of 13th September 1865, paragraph 20:

"In all, the cost of the works will doubtless not be under 800,000 *l.*, or four-fifths of a million sterling. It may come up to a million, or even to a million and a quarter, if unexpected difficulties are met with and prices continue to rise. And this is to afford, not the entire scheme for a permanent navigation all the year round, as was contemplated by the original projectors, but a river navigation of 309 miles from the sea, for four or five months of the year, supplemented by a road of 125 miles to Chanda."

I object to this project and to the estimate of the cost.

1st. I object to the project—

(1.) Because it proposes to substitute 75 miles of road for 73 of river, navigable all the year round, involving, at a trifling saving in the cost of construction, an increase (two or threefold) in the cost of carriage, which would immensely diminish the value of the river as a communication.

(2.) Because the project further includes another 50 miles of road parallel to the river from the third barrier to Sironcha, which will be altogether unnecessary. With the river navigable for the whole year, the construction of a road alongside would be a fruitless waste of money, and even were navigation practicable for five months only, the cost of a piece of road, which would not be in any way a link in the communication at any time of the year, cannot fairly be charged to the river scheme.

2nd. I object to the estimate—

(1.) Because it includes in the expenditure already incurred a sum of 84,780 *l.*, which I have shown was not expended upon any works connected with the scheme, but upon those of altogether distinct and independent schemes.

(2.) Because the estimated amount for completing the first barrier works is set down at 105,000 *l.* for works, and 35,000 *l.* more for establishments, though, in paragraph 44, it is stated that 55,000 *l.* will be sufficient, including establishments.

(3.) I object to the addition of 30 per cent. to the cost of masonry, in the face of the strongly-expressed opinions of the superintending engineers, that the lower rate is sufficient, and, with proper management on the part of the Executive Engineers, ought not to be exceeded. I have, nevertheless, included this additional cost in my estimates.

(4.) I further object to this estimate, because, after bringing up the total to 800,000 *l.*, inclusive of a past expenditure of 286,075 *l.*, with rates raised 30 per cent., and establishments calculated at 33 per cent. on the cost of works (a rate which, I believe, they have never hitherto reached), it is further stated that the total may come to 1,000,000 *l.*, or even to 1,250,000 *l.*

Every possible contingency is, first of all, allowed for; the amount yet to be expended is thus calculated at (800,000 *l.*—286,075 *l.*) 513,925 *l.*, which may very well be provided

in five years, and then the uncertainties, possible difficulties, and contingencies, are stated to be so incapable of calculation that this estimate may be found to come short of the true amount by 450,000 *l.* This is to say, that with full knowledge of the actual cost of work upon the river, and after allowing for every probable source of extra expense, the best estimate we can make of the probable cost of work to be done in the next five years may very possibly be found to be only 54 per cent. of the truth; that the difference may be so great as between 523,000 *l.* and 963,925 *l.**

71. I altogether object to this mode of calculation, and submit that there is nothing whatever in the history of the works hitherto to justify it.

It is quite true that the calculations made before we had any experience whatever of the country where the operations have been carried on have fallen far short of the result. The first estimates for works of this magnitude have always been found very deficient in all parts of India and the world; and in the case of the Godavery, a country almost wholly unknown and scarcely ever traversed by an European until a few years before the works commenced, the difficulty of estimating was peculiarly great. But present circumstances are quite different. We now know so thoroughly the cost of work, and what work *ought* to cost, that the superintending engineer is able to say that the cost of masonry last year was much higher than it should have been. Is it wise to allow for such extra cost in future estimates, and after adding all probable contingencies to state that the result may not improbably be found to fall 50 per cent. short of the truth?

72. Lastly, I object to the result of the expenditure being described as "a river navigation for four or five months of the year," when the estimate includes a sum of 65,000 *l.* for works which it was stated would make the river navigable by vessels of two feet draught for six months.†

73. This method of dealing with the question is, if I may be permitted to use a common expression, "burning the candle at both ends." On the one hand, the *value* of the scheme is enormously reduced by the substitution of road for river on the upper part of the line; its value in this modified form is still further depreciated by a misapprehension as to the extent of navigation it would afford; and, on the other hand, its *cost* is unduly increased (1st) by including the cost of a number of works which formed no part of it whatever; (2nd) by an increase of rates to which I venture to object; and (3rd) by increasing the sum total thus obtained (and with all possible contingences included) *fifty-six per cent.* on the supposition that the work yet to be done in the next five years may exceed the most liberal estimate that can now be made by *ninety per cent.*

Thus by a series of substitutions of road for river, *without investigation as to the practicability or cost of the works proposed for the latter*, the original scheme for opening a line of navigation to a distance of 445 miles from the sea, approved by the Court of Directors and the Secretary of State, dwindles down into a river navigation of 309 miles, and a road of 125 miles, the introduction of the latter at once depriving the scheme of almost the whole of the advantage which it promised—*cheap carriage* to the part of the country most in need of it, and best prepared to benefit by it. So low at last does the scheme sink by this process, that it compares unfavourably, in the opinion of the Government of India, with a common road. As to *cost*, the most liberal estimate that can now be made is increased *ninety per cent.*, to obtain a rough approximation only to the amount which it may be necessary to expend in the next five years.

I submit that this method of dealing with the question can only lead to the most erroneous conclusions.

I may here, also, point out an error in the description of the general project in the letter of the Government of India of 13th September 1865, pars. 10, 11, 12.

"We think it quite possible that the cost of the works in the end may come up to a million and a quarter sterling. And further, when done, the work will not provide what has been contemplated by the projectors of the scheme, a navigation of the Godavery for the entire year, but only for four or five months. So that there is still to be contemplated the possibility of the Government being urged to perfect the work; and not only to carry the navigation past the third barrier and up to the Wurda, but also to store up water to supply the works during the dry season, and to extend the navigation throughout the

* The calculation is as follows:

Probable cost of the works, including establishments, and allowing for an increase of price 30 per cent.	-	-	-	-	-	-	-	-	-	£. 800,000
Deduct amount already expended	-	-	-	-	-	-	-	-	-	286,075
Amount still to be expended	-	-	-	-	-	-	-	-	-	513,925
Add 90 per cent. for unknown contingencies	-	-	-	-	-	-	-	-	-	450,000
Amount that may possibly be required	-	-	-	-	-	-	-	-	-	£. 963,925

† Memorandum by Mr. Temple, 20th August 1862, par. 19. Report by Captain Haig, No. 616, 16th November 1863, par. 29.

the year. To do this would, we think, not cost less than a million, or a million and a half more than the scheme we formerly adopted with your approval. When originally proposed the entire series of works was estimated at 300,000 *l.* to provide this complete navigation."

This is an entire misapprehension, and it is difficult to conceive how it can have arisen in the face of the explicit statements on the subject, both in my Report of 1856 and in the Orders of the Madras Government thereon. I have above shown that the estimate of 300,000 *l.* was for the works at the three barriers only, and for clearing some rock in the reaches between, and that the *additional* works, required for extending the navigation to the whole year, was then roughly estimated at 360,000 *l. more*.

VALUE AND IMPORTANCE OF THE GODAVERY NAVIGATION.

74. In considering, in the next place, the value and importance of this river communication, it will be proper again to revert briefly to what has already been said as to the present condition of the people of the Godavery Valley. Without a distinct understanding of what this really is, we should fail altogether to perceive the true bearings and importance of the Godavery question. It is evident, both from Mr. Temple's reports and from the Despatch of the Government of India, that the opening of this river is regarded quite as a secondary question, a scheme which, if carried out, would be beneficial to a certain extent to the lower part of the valley, but by no means a matter of vital importance, such as it has been represented to be by its promoters. Upon this point I venture to differ entirely with these high authorities, and beg to state my reasons for so doing.

75. What then is the present condition of the Godavery Valley?

In the first place, it is without a foreign market, and production is limited almost entirely to the requirements for home consumption. In other words, the people are engaged almost exclusively in growing their own food. The testimony of the Chief Commissioner, Central Provinces, upon this point is conclusive, and it must be remembered that it applies to by far the most prosperous part of the whole valley, the Nagpore Province.

"It has possessed no natural outlets, like navigable rivers, and no artificial communications like roads. It has grown produce chiefly for its own consumption; it has no special manufactures of its own; nor has it imported largely the products of other places."

It should be added that its principal imports are food and salt, the latter at a rate of only 5 lbs. per head, and at a price three times that of the same article in the coast districts.

76. In regard to revenue, the people of the Nagpore Province pay only 2 *s.* a head; those of the poorer parts of the valley very much less, and the greater part of this amount is a charge upon their food. Their income is simply the value of the grain which they produce for their own use; and the land tax is as much a charge upon this as the cost of ploughing or sowing.

77. In regard to exports, those of the richest part of the valley, Nagpore, are 2 *s.* a head, according to Mr. Temple's tables above given. But I venture to affirm that these tables are not correct, and a mere superficial inspection of them will not give a correct idea of the true state of the case. The value of cotton, for instance, is set down at 3 *d.* per pound, a price which is certainly abnormal, and double what it was only a few years before. The values of other exports are also given at rates which, though they may have been the prevailing rates, convey a wrong impression. Thus, gingelly oil-seeds appear at a value of 82 rupees per ton, or six rupees per bag of two maunds. Now six rupees per bag is considered a good price at the port of Cocanada, and the very highest price ever known there was 8½ rupees in 1863. The cost of carriage to Bombay being 80 to 120 rupees a ton, or six to eight rupees a bag; the total cost of the Nagpore oil-seeds, delivered at Bombay, would be 12 to 14 rupees, a rate at which they would be absolutely unsaleable. In fact, if six rupees a bag were the ordinary price in Nagpore, there could be no export trade in the article whatever.

78. But the fact of these articles having been entered at these rates in tables prepared, as Mr. Temple states, by the soncars, reveals a little more of the actual state of affairs. It would seem, at first sight, from the figures above given, that either the local price of the article in question is much lower than is here represented, or that there is in truth no export of it at all. But I believe both to be true; the lowest price is as stated, and there is a small export trade. The explanation is that all that is exported is supplied to the soncars or great merchants, in whose hand the whole trade and, indeed, the whole country is, at a very much lower rate, perhaps at a third of what is here stated. The great mass of the agricultural population are notoriously in the power of these usurers, and the ryot is compelled, as a necessary concession in order to obtain the advances of money on which he lives, to supply a fixed quantity of this, or of any other article which may be in demand, at a rate which the money-lender fixes. The ryot may not make a single rupee upon the transaction; the rate may barely pay, and perhaps not even pay, the mere expenses of cultivation, but he must live, he is dependent on the money-lender for the means of cultivating, and the latter will lend only on these terms. Every one acquainted with

with India knows this to be quite a common case. In Central India it is the normal state of things. The ryot is *ordered* by the soncar to grow a fixed quantity of a certain grain every year; an advance is made for the purpose, and the soncar takes the article, whether grain, or oil-seeds, or cotton, at his own price. Throughout the part of the Godavery Valley where Teloo-goo is the language, there is a peculiar and expressive form for advances given in this manner. This is the state of matters in Nagpore also, and hence we see that the real value of the exports to the people at large is but a small part of what the tables represent, certainly not above half, if so much. In the former part of this paper I assumed these tables to be correct, because that supposition was sufficient for my purpose at the time, but it is necessary to point out here what is the real state of the case, because it shows two things; first, that the mass of the people are very much poorer than an export trade of even 2*s.* a head would make it appear; and, second, that their present small revenue of 2*s.* a head is in reality in great part *a charge upon their food*, as veritable a bread tax as ever existed in England. And yet I have no doubt it is as low as anywhere in India, and certainly it has been assessed with the most liberal intentions.

79. Again, the true value of all export produce in Nagpore is at least 8*l.* per ton less than it is on the coast; that is, the present cost of carriage to the coast, and, consequently, the value of all articles of export in the interior, is diminished by so much. Now as 8*l.* per ton covers the value of almost all the exports at the port, including cereals of all kinds, oil-seeds, gram, &c., but, excepting cotton, and one or two such highly valuable articles, it follows that there is practically no export trade at present from the interior. If any such products are raised it is only for home consumption, and, of course, in small quantities. In fact, excepting the bare necessities of life, all other articles possess no value.

80. Again, the demand for home consumption being the limit of production, there is no margin between a sufficiency and a deficiency of food. An unfavourable season may at once cause scarcity, and any serious failure of the local rains, wide-spread famine, for which no relief can be obtained from without. Chutteesghur, not, properly speaking, in the Godavery Valley, is, to a certain extent, an exception, being peculiarly and exceptionally favoured in respect of rain; but there over-production, resulting from an unusually propitious season, causes at once a glut in the local markets, and produce becomes almost valueless. In fact, the people of the Godavery Valley, always poor, are perpetually in danger of famine, while those of Chutteesghur oscillate between scarcity and excess.

81. Further, this great population, thus growing their own food, have one import which, to them, is an article of vital necessity—salt. They can, at present, only procure this at a price three times what it costs on the coast, and in quantities averaging only 5 lbs. per head, while it is known that where cheaply supplied, in the coast districts, the consumption averages 15 to 20 lbs. a head. The excessive cost of carriage is one great cause of the dearness of this essential article, but this is further enhanced by a local tax of 1½ rupees per maund, itself doubling the first cost of the article; a tax which, under the peculiar circumstances of the case, I cannot refer to without expressing my regret that such an addition to the burdens of the people should be thought necessary. But it is my duty here simply to state facts. In regard, then, to salt, the facts are that its consumption in the wealthiest part of the Godavery Valley is at the rate of 5 lbs. a head, while in many other districts it is at times not procurable at any price; and the cost is three times as great as on the coast, and three times as great as the poorest labouring man in England can purchase it for without stint as to quantity.*

82. It needs but few words to sum up, from the foregoing, the case as regards the condition of the people of Central India. A population engaged almost exclusively in growing their own food, the price of that food enhanced even by the scanty tax they pay to the Government; the supply of it precarious, dependent on the vicissitudes of the seasons; with few exports and no foreign trade; without any one inducement to exertion beyond the bare necessity to support life; a population under such circumstances cannot be otherwise than poor, dejected, and debased. This may not appear so if the comparison be made with many other parts of India, but it is so in fact; the fundamental conditions of the case are such as can lead to no other result; they have produced the same effects everywhere else, and the result must be the same here also.

83. It is essential that we should thus understand the true state of the case. It has never yet been plainly set forth in any other paper on the subject that I have seen, though all the main facts on which it rests are distinctly admitted in the reports I have quoted. Unless we see clearly the effects, we shall neither seek nor fully appreciate the importance of the cause. Some of the inferences I have drawn may be thought in excess of the truth; if so, they will, doubtless, meet with correction or refutation at the hands of others better qualified to judge, and more familiar than I am with such questions; but the principal facts of the case are undeniable, and certainly establish in the main the views I have expressed.

84. Now,

* Thirty times as dear in proportion to his income.

84. Now, what is the remedy? In the first place, it is very evident that no readjustment of taxation can be of any avail; the land tax is already as low as anywhere in India. Justice is impartially administered, and life and property are secure. Local roads can, as I have already remarked, afford no relief, nor would irrigation under such circumstances have any important effect. Of what use would increased production be in a country which already grows what food, it requires and has no market for anything more? Municipal conservancy, sanitary improvements, must be popular to be successful; a people living from hand to mouth cannot be expected to take an interest in such matters. All these expedients are now in operation, and with what result? Not one of them touches the real evil, and to busy ourselves with them is only to blind ourselves to the true state of the case.

85. What the country needs is a market, a value, the true value in the open markets of the world, for its produce. The burthen that now presses upon its industry must be removed. Cultivation must be rendered profitable, without limit to production. The people must have the means of growing more than they want at home, as much more as the land will yield, and so of accumulating wealth, and shaking off the incubus of debt which now presses them to the earth. The ryot must be delivered out of the hands of the money-lender, and made to feel that, cultivate to whatever extent he may, there will be an unbounded demand, at remunerative prices, for all that he can produce. He must have the means of devoting his land to that kind of cultivation best suited to it, and of stimulating to the utmost its capabilities by the application of the proper agents for the purpose. In other words, cheap communication with a port must penetrate every part of the country.

86. These ideas are not utopian. Such a happier state of things must inevitably follow upon the adoption of the one simple and obvious remedy, and that at no distant date, of which we have abundant proofs in the results which have followed similar improvements elsewhere. We have only to give Central India the facilities for cheap exportation possessed by the agricultural states of America to witness the same prosperity.*

87. We

* I believe that this will be admitted in part, but with large limitation on at least two accounts; (1) that as regards the important staple of cotton, there must be a limit to the utilisation of the land specially suited to its growth; and (2) that any such results as above supposed can only be looked for in a distant future.

The first of these objections is thus stated by Mr. Temple: "That such an enhancement of price would greatly stimulate production cannot be doubted; but there must apparently be a limit beyond which the culture cannot increase. A considerable portion of the area fit for cotton is nevertheless not grown with cotton, being reserved for other staples necessary to provide food for the people and their cattle, such as wheat, millet, oilseeds, and other articles. Some of these might be superseded by cotton; but the millet is almost indispensable, and cannot be obtained equally good from elsewhere." In regard to this objection, I would ask, is such limitation to production found in other countries provided with cheap communications? How was it in the cotton states of America before the war? There was room there for the growth of the food of the slaves; but it is notorious that these were fed, for the most part, on corn imported from distances of 1,000 and 1,500 miles, from the North-Western States. The planters having the means of procuring, by the rivers, food for their slaves, as cheap as they could grow it themselves, devoted their labour to the production of that article which paid best, being specially adapted to their soil. The slaves were employed in growing cotton, and the North-Western States in feeding the slaves. Why should it not be so in Central India? Why should the ryot grow his millet on land which would much more profitably be devoted to cotton, if he can get the millet *cheap* enough from elsewhere? His home-grown food is *dear* to him if it displaces a more profitable cultivation. And we know that there is abundance of room in all other parts of the valley for the production of this article of food, which grows everywhere, and is, in fact, the staple food of the people.

The Mauritius, too, is a case in point. If any country in the world were compelled to grow its own food, this island would be so; but, on the contrary, its rich soil is wholly occupied with sugar plantations, and the population are entirely dependent on foreign countries, chiefly India, 3,000 miles distant, for their food. Berar and Nagpore should unquestionably do the same; and not until their soil is wholly given up to the growth of that staple, for which it possesses advantages unknown in any other part of India, will its full capabilities be developed. But for this purpose it is necessary that food, as good and as *cheap* as is now grown there, should be imported from elsewhere.

In regard to the other objection, that the progress of the country towards such a high degree of prosperity must necessarily be slow, I would observe that, even if this were the case, it would not affect the question of the adoption of the proper remedy for existing evils; but we have an illustration before our eyes of what may follow upon any great enhancement of the value of agricultural products generally. It is only necessary to note what took place during the late war, when the value of Indian cotton was suddenly and so largely increased. The supply responded immediately to the demand. So great and so rapid was the increase of production that even the land required for the growth of food was trenched upon, and a partial scarcity was threatened. There was no delay about the result; effect followed cause immediately. As soon as ever the ryot found that his cotton was worth twice or thrice its former value, he at once extended largely his cultivation of it. And a similar increase of production would certainly follow upon any great enhancement of the value of other articles of export. In present circumstances it is only under very exceptional conditions, as above explained, that any of the great export staples of India, cotton excepted, are grown in Nagpore for other than home use. The export of such articles, worth only 5*l.* to 10*l.* at the port, is impossible, so long as the cost of carriage to the port is 8*l.* per ton. But let that cost be reduced from 8*l.* to 1*l.* or 10*s.* a ton, and the whole of the articles now excluded from foreign markets will at once be exportable; a fair value will at once be given to many of the great staples of the country which before were worthless. It is reasonable to suppose that the ryot who showed himself so ready to take advantage of the rise in the price of cotton, will just as rapidly extend his cultivation of any other products as soon as he finds them to be in good demand at a fair price. Whatever the burthen may have been which has weighed down the springs of industry in India, it has ever been found that its removal has been attended with an immediate revival of energy, and a rapid increase of production. It was so in those districts where a burthensome land tax

87. We come then, at last, distinctly to this conclusion, that what this great country requires, in its present state, is cheap access to a good port. But *cheap* is a relative term, and we must first define precisely what its signification here is.

1st. That will not be a cheap mode of transport which will merely produce such internal traffic as may lessen the present occasional inequalities of production, without increasing the *total* production. It will be of no avail to enable Chutteesghur in a favourable season to send some of its surplus to Nagpore, or Nagpore, under the same circumstances, to Chanda. The *total* production of the country will not be increased by a single bushel after this has been done. The principle of mutual help is a valuable one to the poor; it enables them to struggle on the better through their poverty; but it makes them no richer. Central India being wholly an agricultural country, the markets for its surplus produce *must lie outside of it*; unless it is placed in communication with them nothing has been done. This simple consideration is decisive as to the question of spending money upon the roads now in progress in Central India. They are out of place at present, and can produce only the most insignificant results.

2nd. That will not be a cheap communication which will admit only of the carriage of articles of export to the coast at a cost which would render them unsaleable when they arrived there. This is obvious, and it is decisive with regard to the road which the Government of India suggests as a substitute for the river.

The margin of profit to the grower, between the bare cost of production and a remunerative selling price, out of which the cost of carriage to market must be defrayed, cannot be more than 1*l.* to 1*l.* 10*s.* per ton on the great mass of the agricultural staples of India, which average 6*l.* to 8*l.* in value at the port. The cost of carriage by road in Central India is given by Mr. Temple at three annas; the cheapest rate I have ever known military stores carried from Masalipatam to Nagpore by the existing track, which is a fair enough road in the dry weather, is three and a half annas. On a really good road, however, such as that now supposed, the rate ought not to exceed two annas, or 3*d.* At this rate the cost of carriage 120 miles would swallow up the whole margin of profit on the great mass of the exports; in other words, export by road from a greater distance than 120 miles from the sea would be impossible. Even if the cost of carriage were reduced to one and a half anna, 150 miles from the coast would be the limits within which export would be possible. Upon what principle, then, I venture to ask, is it proposed to substitute a road for a river navigation 400 miles in length? Is the road intended as an outlet to the produce of Nagpore? If so, will that produce bear an export charge of 5*l.* or 6*l.* per ton? If not, of what use is the road to be? Now, I venture to put these questions, because it seems to me just as necessary that when a road is proposed inquiry should be made as to whether it will be of use, and whether it is likely to pay a fair per-centage on the outlay upon it, as it is when a river improvement is proposed. For years the Godavery scheme has been assailed on all sides by inquiries of this nature, and it is well that it should be, because the truth will thus best be brought out. It is estimated to cost 1,350*l.* per mile. A road is now suggested, at an estimated cost of 1,600*l.* per mile. What traffic will there be on which to levy tolls, and what are the tolls likely to amount to? Export traffic there would be little or none; it would be confined solely to the poorer and least prosperous districts on the lower part of the river. All imports would have to pay four to six times the charge by river; they would, therefore, be small in quantity. Under such conditions what return can be hoped for on this outlay, and of what use to the country can the road be? There is but one answer; it would be an almost fruitless waste of money.

88. The Government of India observe: "Navigation is, no doubt, a superior mode of communication in many respects; but its superiority can hardly be considered so great as to

was lightened at an anticipated temporary loss of revenue. No such loss followed; the immediate extension of cultivation at the lower rates of assessment at once more than made up for it. So, too, in Rajahmundry, as soon as ever the water reached the land there was an immense increase of cultivation, even in the case of land which had never been irrigated before, and where the application of water involved a total change in the mode of cultivation.

Mr. Temple observes: "Regarding the country generally, it is to be observed, that although the population may increase in numbers, though the same numbers may acquire a greater industry and productive power, though production may thus increase, though the kind and quality of produce may be highly improved, yet the area of land under cultivation will not apparently increase to any great extent. The cultivable area is for the most part occupied; and though there may be many detached patches of reclaimable land, there is no great extent of valuable waste. A portion, of course, is reserved in most villages for pasturage. This may be gradually encroached upon by the plough, as the people learn to provide superior fodder for their cattle; but some grass ground must, of course, always remain." On this subject I would remark, that very similar anticipations were expressed regarding the effects of the irrigation works in Rajahmundry 15 years ago, anticipations which have been wholly falsified by the result. There the grasslands have been so encroached upon by the plough, that the cattle are driven to the narrow field-banks for pasturage; and in some cases loss of cattle has resulted from this cause. The fact of the export of butter from the Nagpore province shows that there must be a great extent of land available for culture as soon as the demand arises. Besides, there can be no doubt that the present yield of the land, under the slovenly management of a people whose only object is to grow food for themselves, must be far below what it is capable of. Let but the needful stimulus be given, and the yield may increase manifold. It is a fact that while the actual area of land under culture in England at the present time is but the same that it was 20 years ago, in the days of protection, the production of the country under the stimulus of competition with foreign countries has *doubled* in that time.

to make a navigation, open for four or five months in the year, better than a metalled road, open during the entire twelve months." I venture to assert, not only that such a navigation would be superior to such a road, but that while the former would be of the very highest value, the latter would be almost useless. With regard to the road, I have already given my reasons, the cost of carriage by it would be four or five times as great as most of the exports would bear. As to the river, I have already shown that the extra expense caused by the detention of produce for three to six months would be merely the interest on its value, and that if this be added to the river carrier's charge, the total is still only a fraction of the cost by road. In what other part of India, in what other part of the world, does a road create any but the most insignificant export traffic from distances of 300 to 400 miles? There are rivers in America open only for four or five months; but the Americans would smile at the idea of abandoning them for a metalled road.

89. With regard, however, to the river, the Government of India has recorded the following emphatic opinion upon the subject: (Proceedings, 14 July 1863.)

"This part of the project will be a thing complete in itself, and of certain utility, even if the navigation is only open for four or five months in the year. It is an error to consider that such communications as these must be permanently open to be of substantial utility. The Baltic is closed for half the year, and still the trade with its ports is of great importance. The canals of all the colder parts of Europe and America are closed for several months in every year, and yet their value is undisputed. For the transport of mere agricultural produce, a partial communication, such as the Godavery might supply when its ordinary and natural stream shall have been made navigable by the proposed works at the barriers and its beds, will probably be quite as much as the country through which it passes will really require for a long time to come. The crops come in but once a year, and the whole produce for export should easily be got rid of during the four or five months which it may be looked on as pretty certain that the navigation may, under any circumstances, be kept open."

If such be the value of the river, why substitute for it a road by which the export trade of the inland provinces could *not* be affected? And how can the prosecution of a scheme calculated to produce such important results be spoken of thus: (Letter of the Government of India, 13 September 1865.)

"It may be said, to use a common phrase, there is no use throwing good money after bad, and that it will be best to abandon at once these works which have proved, and promise to prove, so expensive, and which, passing through an unhealthy wilderness, are not urgently required in comparison with others from which immediate results may be obtained. Admitting that there is much force in this line of argument, we are not disposed on the whole to abandon the works."*

90. But further, it is very desirable that a similar inquiry to the above should be made respecting the value and necessity for other roads now being constructed in Nagpore and Central India. Money is found for these roads, and their formation proceeds unquestioned, at a cost, it appears, of 1,300 £. per mile.† And yet, if it be asked, what purpose do they fulfil, and is it commensurate with their cost, there can be but one answer, as I have above shown. They are mere local roads, and can produce no effect upon either revenue or people. If, then, the further prosecution of the river scheme, at a cost of 1,350 £. per mile, by which "the whole produce for export could easily be got rid of in four or five months," be in the opinion of the Government of India "throwing good money after bad," on what principle are mere local roads, costing 1,300 £. per mile, now being constructed, which, as admitted on all sides, can have no effect whatever upon the export or import trade of the province? If the purposes fulfilled by these roads are worth an expenditure of 1,300 £. per mile, is a route by which the whole export trade of the Valley may be effected not worth 1,350 £. per mile?

91. But to return to this proposed substitution of road for river, the road never can produce any export traffic. For this, the main object of such a line, as distinctly laid down by the Government of India, and the great desideratum for the Godavery Valley, it must be worthless. The river will effect this essential object.

92. This investigation of the conditions essential to such an export traffic as would result from any great increase of production in the Godavery Valley is equally unfavourable to the Bombay and Nagpore Railway. The great mass of exports cannot bear a charge of

30 rupees

* On this I would observe:

- (1.) The river works are not more expensive than common roads.
- (2.) Their effect upon the country will be incomparably superior to that of any common road.
- (3.) Do the roads now made, or being made, in Central India, yield immediate results, and what are those results as expressed in interest on capital?
- (4.) The term "unhealthy wilderness" is not properly applicable to the whole country in the lower part of the river.
- (5.) If it were so, the navigation certainly ought not to terminate in a wilderness. This would be an additional reason for carrying it past the wilderness at the third barrier into the populous country of Nagpore.

† Including establishments.—Provisional Government of India, 13th September 1865, para. 9.

30 rupees, or 3 l. 6s. per ton, which is the least the railway could afford, even to that corner of the Valley nearest to Bombay. The charge must be reduced to a fraction of this if any great increase of production and traffic is to be effected.

93. That description of transport can alone be considered *cheap* enough which will allow of the produce of the Godavery Valley being delivered at the port, at the current prices there, with profit to the producer. The only markets for the great mass of the produce are beyond sea. The cotton, hemp, oil-seeds, wheat, grain, &c., of this valley will find purchasers only in English and Continental markets. If they are to be exported in any considerable quantities the cost of carriage to the port must not exceed 10 s. to 20 s. a ton. The river alone can afford such cheap carriage as this. No mixture of river and road will do so; the cost of carriage on the 75 miles of road alone, which it has been proposed to substitute for the river above the Third Barrier, would be 1 l. to 1 l. 10 s. per ton, thus increasing the total cost of export to twice or thrice what it should be. This is decisive in regard to any such modification of the river scheme. Its effect would be ruinous. The river communication must be carried into the heart of the country; it should be improved to the utmost that it is capable of, and connected by navigable feeders with every part of the Valley. The river improved only to the extent contemplated in the project above sketched and estimated to cost 721,000 l., will afford transport at the rate of 4 pice or a $\frac{1}{2}$ d. per ton per mile,* or 17 s. a ton from Hingenghat to the port. This, and *this alone*, will meet the requirements of the case. It will render export possible and profitable. It will at once give a fair value to a large number of products which are now almost worthless, and it will afford the means of cheap import of salt and other necessities.

94. The completion of the Godavery navigation scheme to the extent originally contemplated, viz., to Hingenghat, is, therefore, a matter of *fundamental necessity*; it lies at the very foundation of the whole question of improvement in Central India. All that is now being done in that country is of no importance in comparison to it. Whenever it may be determined that Central India shall be raised from its present condition of poverty to one of prosperity, somewhat resembling what we now witness in the Delta districts, the very first step to be taken will be the opening of the river. This is no exaggeration of the real importance of the question. It follows directly from the simple facts of the case as above set forth. The assertion that the completion of this navigation is not a work of urgent necessity is one that cannot for a moment be sustained, unless the facts of the case, as set forth on unimpeachable authority, are ignored. To suppose that the districts on the lower part of the river only are interested in the matter is an entire misapprehension; those further inland are in far greater need of this communication, and their present impoverished condition is mainly attributable to this cause.

95. While, therefore, the case is abundantly plain that the completion of the river works up to Hingenghat is the first thing to be done, we must undoubtedly look forward, if the State is to derive the full benefit of the communication, to the extension of water carriage in connection with the river throughout the whole of Central India, south of the Nerbudda, on some such scheme as that already sketched out by Sir A. Cotton, in his memorandum on the subject, viz., by connecting the Godavery with the Nerbudda, on the north by the Wyne Gunga; with the Taptee on the west; with Hyderabad, by a line of canal, on the south; and by opening out the main Godavery to the full extent it will admit of, that is for some hundreds of miles. The project which is now in course of execution will, when completed, thus form the trunk of a system of water communication which alone can meet the fundamental requirements of Central India. The discussion of such an extension of the scheme is, however, foreign to the present paper, but the system of river improvement by means of reservoirs, on which such an extension would mainly depend, demands a brief notice.

96. In my report of 16th of November 1863, I strongly urged that this mode of improvement should be applied in the first instance to the Wurda, which river is, as I have shown in a former part of this paper, from the gentle declivity of its bed, and from its narrow width, so especially adapted to it. I fully adhere here to all which I then stated. We have in the Wurda a river of only three times the width of the Ganges Canal in its upper part, and of only half its slope, while the depth to be maintained will not be above a third of that in the canal. Surely this is about as simple and as favourable a case as the system could be applied to. And I have also strongly urged, in the report referred to, that the system should thus be tried *on a small scale* in the first instance, using a reservoir which might cost about 20,000 l. or 30,000 l. only. At all events the question of the navigation of the Wurda, and of the practicability of this mode of improvement, is *worthy of investigation*, and this *it has not yet received*, the preference having been given to a road project, the adoption of which would be *fatal* to the success of the whole river scheme.

It should also be observed that the water so stored in the upper part of the Valley cannot in any case be wasted. It is wanted *already* in the Delta, and Mr. Temple has shown

* This is a common rate on the Ganges, even with steam companies dividing 20 per cent. per annum profits. It is considerably higher than in the American rivers, and higher than the rates in the Delta in mixed river and canal navigation, with very small boats and short trips of 20 to 50 miles.

shown that it might be applied profitably to the irrigation of the lands along the banks of the Wurda. The Delta alone will require a stream of at least 600,000 cubic yards* per hour throughout the hot season. If this is not supplied the full value of the works there cannot be realized. I believe I am correct in stating that for a few years past there has been an annual loss of revenue from the insufficiency of the river supply, although not above three-fifths of the land is yet irrigated. The need of an additional supply will now become every year more pressing. I would suggest, therefore, that the Madras Government should now be called upon to state (1) whether there is not now an annual sacrifice of revenue from want of water, and (2) what quantity will be required to supply the wants of the cultivators during the dry months. Then let this quantity be stored without further loss of time in the Wurda, and subserve the double use of navigation and irrigation. This is all that I have ever urged upon this subject, and the necessity of such measures, as regards the Delta only, is now undeniable. A practicable test may thus be applied to the reservoir system without risk of loss.

97. I cannot pass from this part of my subject without respectfully remonstrating against the manner in which it, and, indeed, the whole river question in respect of cost, is treated by the Government of India. I have already objected to the manner in which an addition of 90 per cent. is made to the cost of the Monsoon Navigation Scheme in the estimate given by the Government of India, and I would now further point out the manner in which the completion of the scheme by means of reservoirs is referred to in their letter of 13th September 1865, paragraph 11: "To do this would, we think, not cost less than a million or a million and a half more." Thus in one single sentence this scheme, fraught with results of the highest importance, is set aside. Upon what grounds, I venture to ask, does this assertion rest? I know of none that could in any way warrant it, and I may claim to have more thoroughly investigated this question than any officer who has ever had anything to do with the Godavery scheme, excepting Sir A. Cotton. I venture to assert, and I have little doubt that Sir A. Cotton would entirely confirm my opinion, that the extra cost of rendering the river navigable all the year round, at rates cheaper than those on the Ganges, would not exceed the *fifth part* of the amount here stated.

But why thrust aside the question in this manner when the means are in our hands of applying to it, without risk of loss, such a practical test as would at once determine both the cost and the suitability of this mode of improvement?

REMUNERATIVE CHARACTER OF THE GODAVERY SCHEME.

98. With regard to the profits that may be expected from this undertaking, if I have at all succeeded in what has been the principal object of this paper—placing the question of the Godavery improvement upon its true grounds as a work of absolute and fundamental necessity—there can be little question as to its remunerative character. If once it be admitted to be a work of necessity, its prosecution would no more be delayed by questions as to direct returns, than is that of all the roads now under construction, upon which no profits whatever are anticipated. And upon this point the question is simply reduced to this: either this river improvement is a work of the highest value and most pressing necessity, or it is one of the most trifling importance. If this river will afford the means of export and import to Central India, it will be difficult to assign any limits to its importance. If it will not, it may be placed in the same class as the roads above referred to (though, as above shown, even on this supposition it would be worth what they cost, 1,300*l.* a mile). Upon this point the whole question turns. The one great need of Central India is the means of cheap export. The position which I have maintained in reference to this is (1) the railway cannot supply this essential; (2) a road cannot; (3) the river can. If it can, then the value of the great mass of productions of Central India will be *doubled*; produce now worth 8*l.* to 10*l.* a ton will be relieved of almost the whole of the present export charge of 8*l.* to 9*l.* per ton. This will, in fact, be to give to a large number of commodities, now worthless, a fair value, and immensely to increase production. Wealth must follow, and with it the ability to pay a higher revenue, and to import more largely from foreign countries. And when we consider that taking the trade basin of the Godavery and Wurda alone, and without taking into consideration the ultimate results of the full development of the scheme, a population of 6,000,000, of whom 3,900,000 are British subjects, would benefit in this manner, there can be no question that both the direct and indirect profits upon the undertaking must be great.

99. Taking, however, the one article of salt, the present consumption of which does not, as we have seen, exceed 5 lbs. per head in Nagpore, and perhaps does not amount to that in other parts of the country, there are good grounds to expect that, with the reduction

* This may be much less than will be required; 1,200,000 acres have to be watered, and the supply allowed during the rains is one cubic yard per acre per hour. More than this is required for the same crops in the hot season, but, I believe, by limiting the cultivation to oil-seeds, or some kind of crop not requiring so much water, the ryots manage for the present with about half a cubic yard. The question can easily be decided by a reference to the Madras Government,

tion in the cost of import from 8 l. and 10 l. per ton to 1 l., and with the improved ability in the people to purchase with their exports, the consumption would quickly rise to 15 lbs. Ultimately it would no doubt arise to 20 lbs. At 15 lbs. per head, or 10 lbs. in excess of the present consumption, for the 6,000,000 of people directly dependent on the river for their supplies, the increased import would amount to 60,000,000 lbs. I am not certain what the actual profit of the Government is on the sale of salt, but suppose it is not less than a rupee per maund; if so, the profit on this increased sale would amount to 732,000 rupees, or 73,200 l. per annum, which is 7·3 per cent. on 1,000,000 l., or 10 per cent. on 730,000 l., which is more than the estimated cost of opening the river to Hingenghat.

100. Again, if a toll of $\frac{1}{2}$ penny per ton per mile were levied on the river traffic, or 4 s. a ton for the whole distance between the Nagpore country and the sea, to pay 10 per cent. on 1,000,000 l. would require an annual traffic of 500,000 tons, or 350,000 tons down stream, and 150,000 tons up.

Now I have shown above, in the case of America, what the trade of an agricultural country, provided with really cheap means of export, is likely to be. The average value of the 4,000,000 tons annually exported from the Western States is about 60 dollars, or 12 l. per ton, and the cost of sending a ton of produce from Chicago (the great grain port of the Western States) to New York (1,500 miles) is seven dollars, or 1 l. 8 s., or 12 per cent. only on the value of the article. The charge by the Godavery ought to be considerably lower than this, as the distance will be only 500 miles. Can any one believe that, under such circumstances, 500,000 tons per annum will be more than a fraction of the traffic which must arise?

101. Indirectly also there must be large gain to the revenue. If the value of produce generally is doubled, and production at the same time largely increased, the ability of the people to pay will be much more than doubled. The present revenue is at the rate of less than 2 s. a head. With the means of cheap export 4 s. would be a much lighter burden, and would still be only two-thirds of what Rajahmundry now pays, with the works only in imperfect operation. Another rupee per head of revenue from the 4,000,000 of British subjects on the north bank would amount to 400,000 l. per annum. To effect the whole of this population, however, the works would require extension up the Wyne Gunga, but fully 2,000,000 would benefit to the full, and the remainder partially, by the opening of the river to Hingenghat, and an increase of revenue to the extent of 200,000 l. on this account should certainly follow.

All these calculations only bring out the more strongly the one grand point on which the whole question turns, whether the river will afford the means of really *cheap* export, such as America, such as England, such as France, possesses, or not? If it can, which can only be if the original project of a continuous navigation, extending into the *centre of the country*, is carried out, its value *must be immense*.*

VALUE OF THE GODAVERY AS A MILITARY COMMUNICATION.

ONE word upon this very important aspect of the question. The map shows that for 400 miles the Godavery and Wurda form the dividing line between the British territories on the north bank, and those of the Nizam on the south. I have shown that with light-draught steamers the river, only partially improved, may be navigated for the whole year.

It

* No mixture of road and river will do, such as the Government of India and Mr. Temple propose. Mr. Temple calculates that the substitution of road for river above the Third Barrier would increase the cost of export fourfold. Take, then, the above case of America by way of illustration. A ton of flour, worth 45 dollars, is sent from Chicago to New York, 1,500 miles, by water, for 7 dollars. Increase that charge fourfold, or to 28 dollars, and what becomes of the Western States, of their trade, the value of land, &c.? The trade would be annihilated, and the country sink at once to the level of Central India. What would be the effect of even *doubling* the charge? Let the Americans decide the question. Take the following illustration of the value which the most practical nation on earth sets on cheap transport. In 1835 the cost of carriage from the lakes to tide water on the Hudson had been reduced by the Erie Canal to 6½ dollars per ton (1 l. 5 s.). They then reckoned that by enlarging the canal and locks, so as to admit larger boats, the cost of carriage might be reduced 50 per cent. "John B. Jervis went into a thorough investigation of the subject, and reduced it to a mathematical certainty." They set to work accordingly; the work was carried out in spite of great opposition and difficulties, and in 1861 was opened for traffic. In 1862 we find the State engineer and surveyor congratulating the citizens on the successful attainment of their object, the cost of carriage having been reduced from 6½ dollars to 4½ dollars, more than 50 per cent. "To accomplish this important result the State expended for the enlargement of the Erie Canal, including land damages and interest on loans, 43,639,268 dollars, or 3,727,850 l. sterling." "This important result"—the reduction of the cost of transport from 6½ to 4½ dollars, from 14 per cent. on the value of a ton of flour to 9 per cent. The traffic at the same time increased from 753,000 tons, delivered at tide water, to 3,402,000 tons. Yet in India a proposition to *increase* the cost of export *fourfold*, at a saving in cost of construction of 56,000 l. on a line on which 6,000,000 of people (a larger population than that which contributes the above export trade of 3,400,000 tons) are solely dependent for the means of export, is regarded as a decided improvement upon the original project; so palpable an improvement, in fact, that it is at once adopted, and the original scheme, which would have provided the means of export at a rate as cheap, and *cheaper*, than the Americans have purchased at a cost of *millions*, is quietly put aside as really a matter of very little importance. Two things strike me in connection with this subject: (1) that the Americans do not consider calculations as to the cost of carriage or the probable amount of traffic on a given line "premature," or "wild," or "mere speculations;" and (2) that their estimate of the value of cheap transport is something totally different from ours.

It will thus afford the means of delivering a body of troops at any point, at any time, along the whole of this length of frontier. Hyderabad is now only accessible from the south, east, and west, and in each case by road only. On the north it is distant 400 miles from Nagpore. Over the whole of the intervening country there is at present no means of controlling the population, and insurrection might spread over a great extent of country, and assume formidable proportions before any troops could reach the scene of action. One important line of communication, the track by which the military stores are sent to Nagpore from the coast lies through this country, mostly along the right bank of the river, and in the troubled times of the mutinies a convoy of stores proceeding by this route for the Central India Force was plundered by Rohillas. Utter lawlessness is, indeed, the characteristic of the whole country. It is needless to descant on the value of the Godavery as a military route under such circumstances. Its practically *indestructible* character should be noticed. It will only have three vulnerable points, the three Barriers. At the two lower the locks, the only works liable to injury, are on the British bank. At the Third Barrier an exchange of territory can easily be effected,* which will place the works there also under our control. Railways or canals may be seriously injured by a sudden *coup de main*, or by the treachery of a disaffected population; but this river route must always remain secure, and, from its connection with the port of Cocanada, form the very basis of our military power in Central India.

SUMMARY.

To sum up, the following are the principal points which I have sought to establish:

1. The one great want of Central India, with its population of, probably, 10,000,000, is the means of *cheap export*.

2. By cheap export is to be understood carriage to a port at 10 *s.* to 1 *l.* per ton.

3. Neither road nor railway will afford this. Export by the one would be eight times, and by the other three to four times as great as is required.

4. A road, if practicable, would be found a more expensive undertaking than the river.

5. A river navigation to the distance of 309 miles from the sea, with a road of 75 miles (to Chanda) or 125 miles (to Hingenghat) could not supply cheap enough carriage.

6. The Godavery will afford the cheapest possible means of export.

7. Its value will be out of all proportion to its cost.

8. The adoption of any combination of river and road will be destructive of the value of the communication, and fatal to its success financially.

9. The country above the Third Barrier *is the one most in need of the communication*, and best prepared to take immediate advantage of it, being the most populous and productive.

10. The population, British subjects, below the Third Barrier is only 250,000; that above it 3,500,000.

11. The physical conditions of 100 miles of the river above the Third Barrier are far more favourable for navigation than those of any part of the river below.

12. The practicability of a canal round the Third Barrier is undeniable. The effect of such a canal, in conjunction with the river at its head, would be to make a permanent still-water navigation extending to within a few miles of Chanda, and available at all times of the year.

13. The probable cost of opening the river for navigation for the whole year, by vessels of light draught, from the sea to Hingenghat, 442 miles, will not exceed 800,000 *l.*, of which 538,000 *l.* have yet to be provided.

The navigation so improved will be practicable for steamers of two and two and a half feet draught for six or eight months.

14. The cost per mile of river, including 80 miles of the Godavery proper, which will also be available, will be 1,530 *l.*

15. The

* No particular difficulty was experienced in effecting the exchange by which the Godavery districts on the north bank became British territory in 1860. As I was instrumental in bringing about this transfer, I may be allowed to remark here that its results, as regards the people of those districts, and the security and quiet of the Bustar country to the north, are most gratifying. I have the best means of knowing the real feelings of the people, and am able to state that they are those of unmingled satisfaction at the change of rulers. The people are thoroughly contented, and frequently contrast the security and peace which they now enjoy with the former reign of lawlessness and anarchy.

15. The cost of common roads in Central India is reckoned at 1,300 £. to 1,500 £. per mile.*

16. A single line of railway would cost 15,000 £. per mile, would carry at three times the cost by river, and not above a twentieth part of the quantity.

17. The river will be of immense value as a military communication.

18. Water for the irrigation of the Delta lands during the dry season *must* be stored on the upper river. The river supply is already deficient, and there have been losses of revenue in consequence. The water which it will be necessary to store for this purpose will be of great benefit to the navigation, and probably quite sufficient for all its requirements.

PLAN ON WHICH THE WORKS SHOULD BE PROSECUTED.

In conclusion, I have simply to recommend that the original project for a line of navigation from the sea to Hingenghat be prosecuted without further delay. For an expenditure of not above 800,000 £. we may thus obtain almost all that was originally expected for 660,000 £., viz., a navigation for the whole year, though not for vessels of the full draught of two feet for the whole of that time. The works should be prosecuted as follows:—

(1.) Those for the three Barriers should be put in hand at once and simultaneously, the usual detailed estimates and plans yet wanting for the Third Barrier being submitted and approved in the first instance.

For the completion of these works a further sum of 420,000 £. will be required.

This will open the river to Chanda, 382 miles.

(2.) Let the removal of isolated rocks in the open parts of the bed proceed by degrees, as required.

(3.) Let a thorough examination be made of the Wurda above Chanda, and detailed estimates and plans be submitted for its improvement.

(4.) Let the Madras Government be called upon to state (1) whether there is not now a deficient supply of water for the hot season cultivation in the Delta; and (2) what extra quantity will be required to prevent loss of revenue, and to secure the full value of the works already executed.

Let a portion of this quantity be at once stored for use on the Wurda, and its effect on the navigation practically tested.

(5.) Let the stonework required for the improvement of the shoals proceed either *after* the other works are finished, or in small portions and by slow degrees, during their progress, as may be found necessary.

Lastly, I cannot close this paper without distinctly warning the Government of the consequences of the course which is now being pursued with regard to the Third Barrier. Against any such limitation of the scheme as would confine the benefit of the navigation to the country below that barrier, to a population of 200,000 souls, British subjects, scattered over an immense extent of forest country, instead of extending it to a population of 3,000,000 above the barrier, I distinctly protest, as the most ruinous measure that could possibly be adopted, and fatal to the success of the scheme in every point of view. The objections which I have urged against this modification of the original scheme have *never been answered*. Mr. Temple so far agreed with my views as to consent, and indeed to recommend, that the practicability and probable cost of extending the navigation to Hingenghat should be investigated, and there was even some correspondence respecting the appointment of officers for this purpose. But *nothing has been done*, while the alternative scheme of a road, whose claims rested solely upon the assumed impracticability, or excessive cost (of which not a shadow of proof was ever attempted) of the other, has not only been investigated and estimated for in detail, but has already, very probably, been commenced. Against such a mode of dealing with a great question, so closely affecting the interests of all Central India, I respectfully, but emphatically, protest; and now place on record my deliberate conviction that, if persisted in, it will be fatal to the success of the whole scheme.

F. T. Haig,
Major, Royal Engineers.

* Including establishments. (Proceedings, Government of India, 13 September 1865, paras. 9. 12.)

Enclosure 2, in No. 9.

MEMORANDUM on the Letter of the Government of India to the Secretary of State, dated 13th September 1865, and the Proceedings of the Government of India of the same date, by Major *F. T. Haig*, Royal Engineers.

1. I BEG to submit a few remarks upon some points in the above correspondence which have not been noticed in my memorandum of 1st January 1866, beginning with the letter, to which I shall refer paragraph by paragraph.

2. Para. 4. "The works between the second and third barriers were estimated roughly to cost six and a half lakhs of rupees (65,000 *l.*), of which we have received no later or more precise estimate."

This is an entire mistake; six and a half lakhs was the rough estimate made in 1862 for *all* the works in *all* the reaches between the barriers, from the coast to foot of third barrier.

No more precise estimate has been submitted, because it was in vain to speculate upon the subject in the absence of detailed surveys, on which alone reliable estimates can be based, and because the recommendation, submitted in my letter of 16th November 1863, that such surveys should at once be put in hand, has never, that I am aware of, been adopted. No notice was taken of it in the orders upon that letter.

3. Para. 7. "Of the two detailed projects which have been received, we would remark that, that for the works at the first barrier seems to embrace a greater expenditure than might have been necessary, had our intention of not attempting to provide more than four or five months' navigation been carefully attended to from the first."

The orders of the Government of India, in which it was decided to open the river for a four or five months' navigation, were dated 14th July 1868, No. 1388. They probably reached me (the Governor General being then in the Himalayas) about the middle of September. On the 16th November I submitted a proposition, the precise and sole object of which was to render the first barrier passable for five months only. It formed part of a general scheme for the prosecution of the river works, which was then rejected by the Government of India. It was again strongly urged in the April following, but without avail. It was finally *adopted* by the Government of India in their proceedings of 13th September 1865, para. 41, very nearly *two years after it was first brought forward*.

I do not, therefore, see how it can now be said that the orders of the Government of India on the subject have "not been carefully attended to from the first." During these two years, a great deal of work has been done at the first barrier, which was not necessary for a five months' navigation only. But I am not responsible for this. On the contrary, in my letter of 26th April 1864, I distinctly pointed out that much time and work had already been lost in this way:—

Para. 1. "Time has already been lost, and much labour expended upon works at that (1st) barrier, which, if my proposal be carried into effect, will not be required for years to come, while those necessary for opening an immediate communication have been postponed.

"The money thus expended is of course wasted to some extent, inasmuch as it has been taken from works urgently required,* and devoted to others not likely to yield any return for years."

"I do entreat that, before another working season commences, some definite understanding may be come to as to the plan on which we are to work, and that the present state of uncertainty, so injurious in every way to the progress of the works, may be put an end to."

No orders were passed upon this letter up to the time that I left the Godavery, in September 1864.

I know not what more I could have done to meet the wishes of the Government of India, and object to the statement that their orders could not "have been carefully attended to."

4. Paras. 10, 11. In my other memorandum, I have already remarked upon the vague character of the estimates here given.

5. Para. 12. In the same memorandum, I have pointed out that the original estimate of 300,000 *l.* was not for works intended to provide a complete navigation for the whole year, but for those at the barriers, and some clearance of rock in the bed; for the monsoon navigation project only.

6. Para. 15. "It will, probably, take three years to complete the first barrier works, and five or six years to complete those of the second barrier."

In para. 44 of the proceedings, it is estimated that a cash outlay of four lacs, exclusive of establishments, will suffice to complete the works at the first barrier, and this amount had already been provided in the budget of the current year.

The Government of India's estimate for the second barrier is 13 lacs. Is it meant that this will take five or six years to spend? Half the time ought to be enough, if funds are provided as required.

7. Para. 16. "It may be said that the oscillation of views and changes of plans by the engineers

* Viz., those at second barrier.

engineers indicate anything but a stable and satisfactory appreciation of the best mode of solving the problem." "These changes have continued up to almost the last moment, in regard to the works embraced in the detailed projects which have been submitted, and for the secondary portions of the general project detailed designs are not yet obtained."

With regard to the last sentence, I have already explained why the detailed designs for the secondary portions of the project have not yet been submitted. Such designs cannot be prepared without surveys. I proposed such surveys, but the necessary establishments were not sanctioned.

With regard to the "oscillation of views and changes of plans." I will notice these remarks in reference to each part of the project.

(a) I deny that there has been any oscillation of views in regard to the works at the first barrier. Change of plans there has been, such as a wise regard to the great increase of prices, and gradually discovered difficulties of prosecuting the works, in an almost unknown country, plainly dictated.

The original estimates for the works at this barrier were hastily prepared, and the prices were found, after two years' experience, to be far too low. Mr. Schmidt, a civil engineer, prepared, in 1863, a second estimate of the *same works*, under general instructions from me, but mostly during my absence for two months on leave, which amounted to 350,000 £, and, had it not been for my suppressing an alteration which he had made in my design for the tail locks, it would have amounted to at least 400,000 £. Had I consulted my own interests, I should simply have cancelled this estimate at once, as it was immensely in excess of what was necessary, but knowing that the Government of India were anxious for an estimate at the earliest possible date, I submitted this one, and with it an abstract of one of my own for the same project, but with some modifications of detail only, introduced *with a view to diminish expense*, and not (as I then distinctly explained) because there were any objections to the original project in an engineering point of view.

My estimate amounted to 163,000 £. Now, I ask, was the "change of plans" (although that is not a correct term, inasmuch as the project remained substantially the same, and the changes introduced were mere modifications in the details, such as lowering the height of the annicut three feet, and the suppression of some masonry culverts in the canal), was such a change objectionable, or the reverse? No objection of an engineering kind has ever been brought against the original project, and the modified one was equally sound, or more so. Would the Government have preferred that I should have submitted a project for 400,000 £, instead of setting to work to modify it, so as to reduce the cost to 163,000 £, without in any way injuring the value of the project as an engineering work?

(b) Another *addition* to the project was made, or, rather, proposed, in 1863, an extra set of locks two miles from the head of the canal, for the purpose of opening the communication for four or five months only. This proposal has now, after a lapse of two years, been approved by the Government of India, who appear to regret that it was not carried into effect sooner.

I trust, and presume, therefore, that this addition to the original project was a wise one.

(c) As to differences of opinion between myself and one or two of the Executive Engineers as to petty points of detail in the works, there is but one course for the Government, either to adopt my recommendations for carrying out a project which is, from the first and in all its details, entirely my own, or to put another officer in my place. It is unnecessary here to notice such matters which the superintending engineer ought to be trusted at once to decide upon.

(d) With regard to the project for the *second barrier*, there has been oscillation in my views, but under the following circumstances:—

The original project, which was the same as that now approved by the Government of India, was prepared in 1856, but only in a general way, the levels being then, of course, incomplete.

In 1862, I was pressed by Mr. Temple, who was then drawing up a report on the Godavery, to give another estimate for the same work. I gave a sketch of three ways in which the passage of the barrier might be rendered practicable, all of them the merest *guesses*, no detailed measurements having been made up to that time, nor the original levels verified.

I sent an officer for the latter purpose, but it turned out afterwards that his levels, on which my subsequent projects (above referred to) were based, *were wrong*, and the original ones right. I submit that it is not right, it is not fair, to an officer to call upon him for sketch estimates under such circumstances, and when the detailed levels and surveys subsequently taken enable him to draw up a complete project and estimate, it is not fair to tax him with "oscillation of views," because it differs from the former ones.

I ought to have declined to give such sketch projects when the materials for coming to a decision upon the matter were so very incomplete, and I did demur to doing so, but Mr. Temple's report would have been very incomplete without them, and I therefore consented to give them.

In July 1863, the Government of India stated, that if a preliminary sketch of the works proposed for the second barrier were submitted at once, sanction for some preparatory operations would probably be given. In October, therefore, I took the first opportunity which presented itself of preparing such a sketch, and I then thought that two annicuts might with advantage be substituted for one, the original annicut, however, remaining in

the original site. The *principal* levels were by this time complete, but a large number of the detailed levels were wanting, and the *river bed was submerged*, it being still the flood season.

I submitted then a sketch project for two annicuts, estimating its cost within a lakh of what the one ultimately decided upon amounted to.

But when, in the cold season, in the subsidence of the floods, I came to take the detailed levels of the river bed, I found that there were objections to this project, and after a careful examination of it, reverted to the original one, which has now been approved by the Government of India.

It would have been better in this instance, if I had not brought forward any project until the levels and surveys were completed, but the inducement to do so held out by the Government of India was strong. To have refrained from doing so would have been at once to have sacrificed a whole working season.

(e) My views with regard to the kind of work to be used in the open parts of the river bed have not varied since I first examined the river.

PROCEEDINGS, Government of India, 13th September 1865.

I proceed to offer a few remarks on the above.

7. Paras. 16 and 37. It is evident from these paragraphs that the Government of India supposes that, in consequence of some changes of plans at the first barrier, some of the work done there has been abandoned, with the loss of the money expended upon it.

They speak of "abandoned work in the tramways and first barrier," the latter owing apparently (para. 37) to a change "in the site of the dam" or annicut.

As regards the tramways, I have explained in my other memorandum that the work done in those at second and third barriers has been in great part lost, in consequence of the Government of India declining to proceed with the project commenced by the Government of Madras. But in regard to the *navigation works* (annicut and canal) the above statement is an entire mistake. *No work has been abandoned. No change has been made in the site of the dam*, which stands in the identical site originally proposed in 1856.

No work has been abandoned in the canal. I cannot conceive how such an entire misapprehension of fact can have arisen, at least if the information before the Government of India was official and public only.

9. Para. 19. "As a consequence, the money hitherto spent upon the project has produced no adequate result."

This statement has a certain appearance of fact, if the whole expenditure previous to 1st May 1865, on tramways and river works, be lumped together.

As regards the tramways, it is of course true. As regards the navigation works, it has not the slightest foundation.

The works in such a country are, of course, expensive, but the value of the communication when opened will, as even the Government of India seems (para. 14 of letter) to be disposed to admit, be far in excess of its cost.

10. Para. 40 (conclusion). "Though urged by the Chief Commissioner to prepare a detailed design and estimate" (for the additional locks proposed for the five months' navigation at first barrier) "Captain Haig had not done so."

Here, again, is an entire misstatement of fact. *I never received any orders whatever from the Chief Commissioner on the subject.*

The history of the case is this. My letter, submitting the project, was dated 16th November 1863. There was at that time, of course unknown to me, an entire miscarriage of business in the Secretariat of the Chief Commissioner, and not hearing anything on the subject of my letter until, I believe, February, I wrote to the Chief Engineer, to inquire what had been done about it. In reply, I received a copy of the Chief Commissioner's forwarding letter, in which he mentioned that he had called upon me for detailed estimates (though I had never received any such order). Immediately after came the orders of the Government of India, in which my proposal was set aside.

There was, therefore, of course no further use in sending up estimates.

In April, as above mentioned, I again pressed the question upon the attention of the Government of India, but without success, and no orders were passed upon it until September 1865. I never received any orders from the Chief Commissioner on the subject. It is just possible that his letter may have miscarried, as others did at that time; but I doubt this, because duplicates of all missing letters were afterwards sent, and this certainly was not among the number.

It is not improbable that some of the mistakes and misapprehensions above referred to may have arisen in consequence of the confusion into which the whole of the correspondence of 1863-64 was thrown, by the loss or destruction of letters in the Secretary's office at Nagpore. Some of the most important documents connected with the works went up to the Government of India in a wrong order altogether. Others, to which reference was made in these, were not sent up for some months after. Some were lost altogether. The estimates for the first barrier works, dispatched from my office in September 1863, were

not

not received by the Government of India until July 1864. The preliminary project for second barrier, submitted in October 1863, was, I believe, still further delayed.

In the meantime, my letter of 16th November 1863 went up, and was disposed of *without the Government of India having seen the other two*. It is not improbable that the Government of India thought that the estimates given in that letter for the first and second barriers were mere guesses, though they turn out to be substantially correct, and this may have led to misapprehension on other points.

11. Paras. 55 to 63. Without noticing these in detail, I will only state my belief that if the original report of 1856, and the most important letters only of 1863-64, had been referred to, all the information, or certainly the greater part of it, the absence of which is complained of, might have been obtained. And I would also refer to the request which I submitted in April 1864, to be permitted to proceed to Calcutta to give any information which might be desired, if the Government were not fully satisfied in all points. The fact of my leaving India in September rendered such an interview the more desirable. It would have cleared up many doubts and misapprehensions; and as it was not permitted, I cannot understand why I am now charged with failing to supply full information.

2 January 1866.

F. T. Haig, Major,
Royal Engineers.

— No. 10. —

(Public Works—No. 160 of 1865.)

To the Right Honourable Sir *Charles Wood*, Bart., G.C.B., Secretary of State for India.

Sir,

Public Works Department, Fort William,
19 December 1865.

IN continuation of our Despatch, No. 116, dated the 13th September 1865, reporting proceedings in connection with the navigation works on the River Godavery, we have the honour to forward a copy of the papers noted below, on the subject of the road proposed to be constructed from Chanda to the foot of the third barrier near Mogullee, on the right bank of the Prenhita.

Civil Works.
Communications.

We have, &c.

(signed) *John Lawrence.*
W. R. Mansfield.
H. S. Maine.
W. Grey.
G. N. Taylor.
W. N. Massey.
H. M. Durand.

Enclosure 1, in No. 10.

(No. 4802, dated 18th November 1865.)

From Lieutenant Colonel *W. Maxwell*, R.A., Secretary to Chief Commissioner, Central Provinces, in the Public Works Department, to Secretary to Government of India, Public Works Department.

I AM directed to forward, for the inspection of the Supreme Government, the surveys, as per margin, of the road proposed to be constructed from Chanda to the foot of the third barrier near Mogullee on the right bank of the Prenhita, in connection with the navigation works in progress on the Godavery.

1 Index Map.
11 Sheets of Details.

2. The survey party consisted of Lieutenant P. Montgomerie, R.E., Executive Engineer, Lieutenant Harvey, R.E., and Mr. W. Scott, C.E., Assistant Engineers, assisted by Supervisor D. Venkutratnum.

The operations in the field were commenced in January, and terminated in April last.

On their completion, Lieutenants Montgomerie and Harvey were removed from the Godavery Circle to another part of these provinces, and the plotting of the surveys and sections was entrusted to Supervisor D. Venkutratnum, with full instructions by Lieutenant Montgomerie, and I am to express the Chief Commissioner's satisfaction at the creditable manner in which the papers, now submitted, have been got up so far as they go.

Mr. Temple regrets that, owing to Lieutenants Montgomerie and Harvey having pro-

ceeded to Europe on sick leave, and to there being no other engineer officer available for the duty, the preparation of the estimate for the road and the designs of the bridges cannot at present be undertaken.

3. In submitting these surveys, I am directed to state that the Chief Commissioner does not consider it necessary that the road be extended beyond Mogullee or to Sironcha as proposed, and approximately estimated for at para. 9 of the observations contained in the Resolution of the Government of India, Nos. 930—3c, dated the 13th September last.

Mr. Temple is still of opinion that the road should stop at the foot of the third barrier.

The distance from Chanda to Mogullee, according to Lieutenant Montgomerie's survey, is exactly 70 miles, and as there is not a single serious engineering difficulty in the whole distance, the cost of making a good road suitable for heavy traffic is not likely to exceed 10,000 rupees a mile, or seven lakhs for the entire distance.

This is less than half the amount set down for the road in the Resolution just mentioned.

4. I am further to state that in obedience to the instructions conveyed at para. 41 of the Resolution, the whole of the works which were in active progress below the village of Gongole, where it is now proposed to construct locks to connect the navigation above the anicut with the river below it, have been stopped, and the Executive Engineer has been directed to concentrate all his available labour on the two miles of canal between Gongole and the head lock near Doomagoodiem. He has also been instructed to submit a plan and estimate for the proposed locks at his very earliest convenience for submission to the Supreme Government.

The Chief Commissioner's own opinion is not favourable to the minor project subsequently recommended by Captain Haig, and now about to be adopted by the Government of India. Moreover, as nearly the whole length of the canal below Gongole has been fully excavated, or is already in existence as a natural nullah, and one of the locks well advanced, the question naturally arises whether it would not be better now to build the tail locks and complete the canal to Sodarum, as at first intended, rather than construct the locks near Gongole?

The former is decidedly the more perfect arrangement of the two, and it could now be completed almost as soon as the latter, and at not very much greater cost.

This point will doubtless be investigated by the committee of engineer officers who are to report on the Godavery works early next year, meanwhile no further steps need be taken as regards the Gongole Locks than procuring and submitting the plans and estimate for them.

The works situated above Gongole, including the anicut, which have received the final approval of the Government of India, shall be pushed on to completion as fast as possible.

Enclosure 2, in No. 10.

(No. 1236 c, dated 19th December 1865.)

From Lieutenant Colonel C. H. Dickens, R.A., Secretary to Government of India, Public Works Department, to Chief Commissioner of the Central Provinces.

I AM directed to acknowledge receipt of your Secretary's letter No. 4802, dated the 18th November 1865, forwarding surveys of the road proposed to be constructed from Chanda to the foot of the third barrier, in connection with the navigation works in progress on the River Godavery, and in reply to state that the Governor General in Council concurs fully in the commendations bestowed by you on the way in which the survey and plans have been executed by the officers named in the margin, of whom the two first named have been obliged to proceed to Europe owing to illness contracted, it is believed, in the performance of their duty.

2. His Excellency in Council also accepts the conclusion arrived at by you that the road need not be carried to Seroncha.

3. The subject of the estimate of the cost of the road, and the other points concerning the works at the first barrier, referred to in your Secretary's letter, will be reserved for consideration with the report of Colonels Anderson and Fife when received.

4. The drawings are returned.

Lieutenant
L. Montgomerie,
R.E.
Lieut. Harvey, R.E.
Mr. W. Scott,
Inspector
Venkutrutnum.

— No. 11. —

(No. 12.—Public.—Government of India.—Public Works Department.)

To the Right Honourable Sir *Charles Wood*, Bart., G.C.B., Secretary of State
for India.

Sir,

Fort William, 17 January 1866.

WITH reference to para. 18 of our Despatch, No 116, dated 13th September last, regarding the Upper Godavery Navigation Works, we have now the honour to report that the officers named in the margin have been deputed to examine and report on the project. The instructions given by us for their guidance will be found in our Secretary's letter to the Chief Commissioner of the Central Provinces, No. 1221c, dated 14th December 1865, a copy of which is enclosed.

Civil Works
Communications.Lieutenant Colonel
Anderson, R.E.,
Madras.
Lieutenant Colonel
Fife, R.E., Bombay.

We have, &c.

(signed)

John Lawrence.
W. R. Mansfield.
H. S. Maine.
W. Grey.
G. N. Taylor.
W. N. Massey.
H. M. Durand.



Enclosure in No. 11.

(No. 1221 c.)

From Lieut. Colonel *C. H. Dickens*, R.A., Secretary to the Government of India, to the
Chief Commissioner of the Central Provinces.

Sir,

Public Works Department, Fort William,
14 December 1865.

WITH reference to para. 26 of this Office Resolution, No. 930 c., of 13th September last, and in reply to your Secretary's letter, No. 4654 of the 14th ultimo, I am now directed to inform you that the officers named below have been placed at the disposal of the Government of India for the duty of examining and reporting on the Godavery project:—

Civil Works.
Communications.

Lieutenant Colonel Anderson, R.E., Madras.
Lieutenant Colonel Fife, R.E., Bombay.

2. While employed on the duty, these officers will each receive a deputation allowance of 500 rupees a month with *bonâ fide* travelling expenses, in addition to the allowances they are at present in receipt of. The whole of their allowances (excepting military pay proper) will be chargeable to the Central Provinces from the date of their being relieved from duty under their own Governments till the date of their re-joining, and you are requested to arrange the Budget provision accordingly under the usual rules and sanction.

3. It will be best for Colonel Fife to proceed to Madras, and thence he may accompany Colonel Anderson to Doomagoodium, the two officers arriving there about the 15th of January, and meeting Major Stoddard, who should provide all needful plans and documents, and accompany them over the site of the works in progress and projected, as far as they come within the scheme of works recommended by you, and approved by the Government of India. The three officers should then proceed to Nagpoor, where Colonels Anderson and Fife should draw up their Report, and submit it to you.

4. After receiving the report, and consulting with them on any points on which you may desire more special information, you are requested to inform these officers that their duty is ended, and that they are permitted to return to their own Presidencies. You will submit their Report, with your own observations, to the Government of India.

5. The main points to which the attention of Colonels Anderson and Fife should be directed, are these—

1st. Whether the works which have been executed appear to be sound and good, and likely to stand without addition beyond the completion of the designs in hand, as recently approved by the Government of India.

2nd. Whether the past management appears, on the whole, to have been careful and economical, considering the difficulties involved in the undertaking.

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3rd. Whether there is reason to believe that works of the general character of those now in progress and designed, will effect the object in view of affording navigation for four or five months of the year, or for any further period, regard being had to the state of the intermediate portions of the river, and the extent of the water supply?

4th. Whether the works as now designed are the best for carrying out the object in view, or what alterations are recommended, or whether any reduction of the cost can be accomplished without impairing their efficiency?

5th. Will it be necessary to look forward to extending the works and increasing the natural supply of water in the dry season before an efficient communication can be looked for, or will it suffice to complete the works on the scale now contemplated?

6th. Whether the estimates appear to represent fairly the probable cost of the works, and considering the outlay up to the 1st May 1865, as amounting to 280,000 *l.*, whether the Government is likely to be able to complete the scheme contemplated for 520,000 *l.* more, or for 800,000 *l.* in all, and if not, for what sum?

7th. Whether the communication as at present contemplated, or as proposed to be ultimately extended, is likely to be worth the money expended upon it; or, supposing that it is not so, if the past expenditure be reckoned, is it likely to be so, omitting that, and counting only prospective expenditure?

8th. If it should be determined to proceed with the works, should they be carried on all at once as rapidly as possible, or only one by one?

9th. If it be determined to proceed with the works, what improvements in the scheme of management seem practicable and proper; and should the transport and supply agency be maintained or not?

6. It will be well for Mr. Isaac, who has been long on the works and is known to have experience in hydraulic engineering, and to have formed opinions differing from the other authorities on this question, to remain at Doomagoodium and explain his views to Colonels Anderson and Fife.

7. Major Stoddard should be requested to arrange for all needful travelling equipments for Colonels Anderson and Fife, so that these officers may suffer no unnecessary detention in proceeding up the Godavery and to Nagpoor.

8. You are requested to add any matters which occur to you as additional points for report, and to invite Colonels Anderson and Fife to state their views on the whole subject without special restriction to the points specified. But it is not intended that they should prolong the inquiry in order to procure information which will not be obtainable during a journey and residence at Nagpoor, as contemplated in the second and third paragraphs of this letter.

9. As the Government cannot expect to obtain any further or better professional opinion, before coming to a final decision on the question of the Godavery Works, than that of Colonels Anderson and Fife, you are requested to impress upon them the desire of the Government of India that they should express their opinion fully and unreservedly. On some points the information before them may be full, on others partial, and on others they may have little else than their own general impressions to guide them. But the Government of India would wish them to state their views on all points to the best of their ability according to the information they possess. They may guard their expression of opinion by referring to the defects of the information; but the Government might lose valuable suggestions if Colonels Anderson and Fife were to confine their report only to points on which they could adduce proof of the accuracy of their views.

10. Copies of this letter, and of the resolution of the Government of India, have been forwarded to Colonels Anderson and Fife through the Madras and Bombay Governments respectively.

— No. 12. —

EXTRACTS, PUBLIC WORKS DESPATCH, to the Government of India,
dated 9th June (No. 28) 1866.

Letter No. 160, dated
11th December 1865.

Para. 2. In Sir Charles Wood's Despatch, No. 11, of 8th February last, it was remarked with reference to the subject of communication with the Nagpore country, that water communication, if obtainable at a reasonable expense, would be far preferable to a road, and that if navigation could be extended as far as Hinginghat, or even as far as Chanda, the proposed road from the latter place to the foot of the third barrier would apparently be superfluous.

3. As the subject will again receive your consideration in connection with
the

the report of Colonels Anderson and Fife, any further observations thereon seem at present unnecessary.

* * * * *

9. The selection of Colonels Anderson and Fife to report on the Upper Godavery Navigation Works has my approval. I shall, of course, be furnished with their report as soon as received. Letter No. 12, dated 17 January 1866.

— No. 13. —

(No. 71—Public Works.—Government of India.—Public Works Department.)

To the Right Honourable the Earl De Grey and Ripon, Secretary of State for India.

My Lord,

Simla, 10 May 1866.

IN continuation of our letter, No. 90, dated the 9th August 1865, we have the honour to forward the accompanying copy of the Progress Report of the Godavery Works for the half-year ending 31st October 1865. The work done during this period is comparatively small, and the principal cause assigned for this is the difficulty which the Executive Engineer in charge of the works had to contend with, owing to the outbreak of cholera amongst the labourers.

Civil Works Communications.

We have, &c.

(signed) *John Lawrence.*
W. R. Mansfield.
H. S. Maine.
W. Grey.
G. N. Taylor.
W. N. Massey.
H. M. Durand.

Enclosure 1, in No. 13.

(No. 181—7473, dated 12th April 1866.)

From Colonel *W. Maxwell*, B. A., Secretary to Chief Commissioner of Central Provinces, in the Public Works Department, to Secretary to Government of India, Public Works Department.

I AM directed to forward, for the information of the Government of India, in original, a letter, No. 178—7095, of 23rd ultimo, with enclosures,* from the Officiating Superintending Engineer, Nagpoor Circle, submitting Progress Report for the half-year ending 31st October 1865, of the navigation works on the Godavery, and with reference to para. 4 thereof, wherein mention is made of the excessive cost of masonry, to state that the Superintending Engineer has been requested to impress on the Executive Engineer, Upper Godavery Division, the need of economy in this item of work.

- *1. Statement marked (A.)
- 2. Letter No. 1183, dated 14th December 1865, from Executive Engineer, Upper Godavery Works, to Superintending Engineer, Nagpoor Circle.
- 3. From Superintendent Transport and Supply Division, to Superintending Engineer, Nagpoor Circle, No. 1455, dated 20th January 1866, with five statements.
- 4. Six diagrams.

2. I am also to observe that the manner in which the duties connected with the Transport and Supply Department have been conducted, as noticed in Major Stoddard's Report, reflect credit on the management of the Acting Superintendent, Mr. E. De Gronsilliers.

Enclosure 2, in No. 13.

(No. 178—7095, dated 23rd March 1866.)

From Major J. Stoddard, Superintending Engineer, Nagpoor Circle, to Secretary to Chief Commissioner of Central Provinces, in the Public Works Department.

I HAVE the honour to submit the Progress Report for the half-year ending 31st October 1865, of the navigation works on the Godavery.

I much regret the great delay which has occurred in its submission, but I did not receive Mr. Isaac's report till just a day or two before I left Nagpoor for Coconada, and as I have been travelling with Colonels Anderson and Fife since, I have not had time to prepare my report before this.

2. The quantity of work done in the half year was not great.

Mr. Isaac, in his letter which accompanies this report, gives several reasons for the small out-turn of work, namely, 1st, the outbreak of cholera in April last, which seriously diminished the number of labourers—more than half of the force having been killed or dispersed by that disease; 2nd, the monsoon,—the half-year under review embracing the whole of the rainy months; 3rd, the stoppage of the works in the third subdivision by order of the Government of India, and the removal of the working party and establishments to Doomagodiem, whereby a fortnight was lost.

3. The works in progress during the half year were the following :—

1. Anicut,
2. Scouring Sluices,
3. Head Lock,
4. 1st Section of Canal,
5. 2nd Section of Canal, and
6. Upper Tail Lock.

The percentage of work done on each of the foregoing during the half-year was as follows :—

On Anicut	3 per cent.
„ Scouring Sluices,	31 $\frac{2}{3}$
„ Head Lock,	1 $\frac{1}{2}$
„ 1st Section Canal,	11 $\frac{1}{10}$
„ 2nd Section Canal,	10 $\frac{1}{5}$
„ Upper Tail Lock,	48 $\frac{1}{10}$

per cent. of the total quantities, as per revised estimates.

4. Attached to this report is a statement marked (A.), which shows, in a tabular form, the progress of the works, and the cost up to end of the half year. Also the percentage of all work, and cost done up to that date, as compared with the estimates.

By comparing the figures in columns 6 and 9, the results entered in column 10 are arrived at. These figures show that the actual cost of the three first works has exceeded the estimate, and that of the three last has fallen below the estimate.

Taking the two principal items “masonry” and “earth work” separately, the abstract at foot of the statement shows that the cost of the former has exceeded the estimate about 21 per cent., and that the cost of the latter has fallen about 30 per cent. below the estimate.

It should be here stated that the figures in Statement (A.) show only the actual expenditure incurred on each specific work as entered in the “day-books” of the engineer. Besides this there is always a considerable expenditure under other heads, such as “Miscellaneous charges against labour;” “repairs to tramways and floating stock;” establishments, “tools and plant,” &c., &c. Of these only the first item is properly chargeable to the cost of the work.

The nature of these charges is such that it is not possible to apportion them fairly to each work at present in progress.

The fairest, indeed, the only way in which they can be dealt with is to charge them off *pro rata*, after the works are all completed.

When this comes to be done, I believe that fully 30 per cent. will have to be added to the cost of construction, and that the masonry work will have then probably exceeded the estimate by 50 per cent., while the cost of the “earth-work” will neither have exceeded nor fallen below the estimate.

Very much could be done by good management, no doubt, to reduce the present excessive cost of the masonry work.

During the half-year under review, the average quantity of rubble masonry done per man was only 7 $\frac{1}{2}$ cubic feet per diem.

It should have been three times as much if the work-people did not idle, as they must have done to turn out so insignificant a quantity of work as 7 $\frac{1}{2}$ cubic feet per day per man.

5. Accompanying this report are six diagrams illustrative of the progress of the works.

6. I will now briefly notice the operations of the Transport and Supply Department during the half year under review.

This Department has been under the management of Mr. De Gronsilliers, who has certainly conducted the duties most satisfactorily. I beg to append his report, which will speak for itself.

7. Under the head of “Supply,” the operations during the half-year consisted of purchases and sales of provisions, &c., to the value of 1,39,563 rupees.

The expenditure in this branch on account of establishments of all kind of labour and contingencies amounted to 12,683 rupees, or about 9 per cent. of the total value of the transactions.

8. In the "transport" branch it appears that 176,492 tons per mile were carried by water on the 1st reach, and 92,937 tons per mile on the 2nd reach of the river, making a total of 269,429 tons carried one mile.

The expenditure incurred on both reaches, inclusive of establishments of all kinds, labour &c., was 22,280 rupees, which makes the rate for water carriage $1\frac{1}{2}$ anna per ton per mile; but as a sum of 4,512 rupees, was received from passengers and private goods carried, this should be deducted from the expenditure, which will have the effect of reducing the rate from $1\frac{1}{2}$ to about one anna per ton per mile.

It appears from Mr. De Gronsilliers' report that, on a comparison of the results of the transport operations in the present half-year, with those of the corresponding six months in 1864-65, there has been a saving of upwards of 13,000 rupees in the expenditure, and a reduction of $14\frac{1}{2}$ pie per ton per mile in the rate.

This is very creditable to his management.

9. The cost of the land carriage was, however, higher in the present half-year than in 1864-65, notwithstanding a large decrease of expenditure in the maintenance and working of the tramway of nearly 4,000 rupees.

The causes of this are explained at para. 41 of Mr. De Gronsilliers' report.

Taking both water and land carriage together, however, it will be found that the rate per ton per mile was less by just 9 pies in the first half of 1865-66, than in the corresponding period of 1864-65.

10. It is necessary, perhaps, in conclusion to notice Mr. De Gronsilliers' remark at para. 29 of his report.

He there refers to a proposal which he made in October last, to be allowed to make contracts on the coast for the supply of rice to the workpeople in 1866-67.

Just before his proposal was received, the resolution of Government regarding the Godavery works arrived, and as it then became very doubtful if the works would be continued in 1866-67, Mr. De Gronsilliers was informed that it would be inexpedient to make any large contracts which might involve the loss of advances or other serious penalty, should their fulfilment not be necessary on our part.

(A.)

PROGRESS REPORT OF WORKS under Construction at the First Barrier, Upper Godavery, for Half-year ending 31st October 1865; also showing TOTAL WORK done to that Date, and the COST.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
NAME OF WORK.	Quantity as per Estimate.	Quantity done in Half-year.	Total Quantity to 31st October 1865.	Percentage of Work done in Half-year.	Percentage of Work done to 31st October.	Estimated Cost.	Actual Cost to Date.	Percentage of Cost of Work done.	Percentage of Excess on Estimate, or below ditto.
	<i>C. Ft.</i>	<i>C. Ft.</i>	<i>C. Ft.</i>	<i>P. C.</i>	<i>P. C.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>P. C.</i>	<i>P. C.</i>
Cut - - -	782,675	23,966	359,676	3.06	45.95	2,20,914	1,28,189	58.03	+ 26.29
Ice wall - - -	200,185	63,318	183,278	31.63	91.55	71,430	81,710	114.4	+ 25.00
Lock - - -	256,962	4,503	60,380	1.75	23.5	88,457	28,368	32.07	+ 36.47
Section Canal - -	39,809,696	4,420,964	8,609,479	11.10	21.62	3,95,305	65,185	16.5	- 23.68
" " - -	35,994,840	3,703,134	19,001,273	10.3	52.8	3,67,669	1,27,518	34.7	- 34.3
er Tail Lock - -	125,903	61,439	77,373	48.8	61.45	44,161	17,816	40.35	- 34.33
ABSTRACT OF FOREGOING.									
onry - - -	1,365,725	153,226	680,707	11.15	49.84	4,24,962	2,56,083	60.26	+ 20.9
hwork - - -	75,804,536	8,124,098	27,610,752	10.72	36.42	7,62,974	1,92,703	25.26	- 30.64

N.B.—In last column + shows excess over estimated cost, and — reduction, or below estimated cost.

Nagpoor,
3 March 1866. }

J. F. Stoddard, Major,
Offg. Supdg. Engr., Nagpoor Circle.

(No. 1183, dated 14th December 1865.)

From *T. J. Isaac*, Esq., C.E., Executive Engineer, Upper Godavery, to Officiating Superintending Engineer, Nagpoor Circle.

IN forwarding the section to accompany Report of Progress on the Upper Godavery works for the half-year ending 1st November 1865, I have the honour to make the following remarks in regard to the small out-turn of works.

2. Just before the commencement of the half-year, the outbreak of cholera amongst the labourers had reduced the force to less than one-half of what it was prior to the outbreak. The operations for the half-year commenced, therefore, under unfavourable auspices.

3. In addition to this, the period under review comprised the whole of the rainy season, during which the progress of works is always more or less impeded all over India. The great reduction in the budget allotment for the year also rendered it impossible to push on the works with much vigour.

4. Lastly, the stoppage of all the works in the third subdivision in October, caused the loss of nearly a fortnight, as far as the force in that subdivision was concerned, as it took about that time before the labourers could be induced to settle down properly to their new work.

5. Regarding the works themselves, I would observe that the disastrous outbreak of cholera caused the dispersion of our large force at a most critical moment for the sluice-wall and head lock. These works were progressing so well and rapidly at the time of the outbreak, that there was every prospect of having them in a safe condition before the rains, but after the dispersion of the force, the work at the head lock had to be abandoned for the season, and it was found impossible to close up the flood embankments at the sluice-wall, so as to render everything safe. Fortunately the freshets of the past season were very low. Had the river risen as high as it rose in 1861 and 1863, the damage that would have been done would have been serious.

6. The sluice-wall is now finished, and the flood banks in connection with it are almost finished also, so that no danger is to be apprehended except from abnormal floods higher than the rise of 1861.

7. The head lock is also fairly under way, and there is every prospect of completing it before next rains.

(No. 1455, dated 20th January 1866.)

From *E. De Gronsilliers*, Esq., Acting Superintendent, Transport and Supply Division, to Officiating Superintending Engineer, Nagpoor Circle.

I HAVE the honour to lay before you a summary of the operations of this department, during the half-year ending 31st October 1865-66, and for that purpose have prepared and annexed a Statement (A.), in which the purchases and sales, with the expenditure for establishment, labour, and carriage, also expenditure of river transport, in each reach separately, and transport by tramway, with the quantities carried, and the percentage on temporary and permanent establishment, and the cost per ton per mile have been given.

2. In order also that the proceedings of the river and land transport may be distinctly and separately shown, I have computed Statement (B.), in which the progress of each steamer has been given, and Statement (C.), in which the particulars of the progress of the tramway are clearly and distinctly shown.

3. That, further, the cost of permanent establishment, and the way I have allotted to each branch, a certain portion of it may be seen at a glance, I annex Statement (D.)

4. To above Statements I beg, therefore, to draw your attention, as they are the basis on which this report has been framed; they have been carefully compiled, and I can vouch for their correctness.

5. In regard now to the general proceedings of the Transport and Supply Department, I beg to state that they were much the same as formerly; they consisted—

(a.) In the purchases, storage, sale, &c., of provisions for the use of the Upper Godavery workpeople. This is called the Supply Branch.

(b.) In the carriage of provisions, engineer stores, materials for work, &c., to wherever they were required, and this is called the Transport Agency.

A.—SUPPLY.

6. All our present stock in hand was purchased on the coast, as also all stock sold from 1st May up to date; selling, therefore, rice, our staple article, at 16 seers per rupee, or five rupees per bag, when we had to pay on an average *Rs.* 4. 12. per bag, will not leave a large profit. However, no correct estimate of the actual profits can be framed now, as during the coming half-year a considerable quantity of rice is expected from Bustar, which, cheaply purchased, will add much to the profits, and as my last report was for the whole year, another six months operations should be added to this report before a fair comparison can be made with former proceedings. For this reason I have not given sales and purchases in detail, but only shown the totals and the expenditure thereon.

7. In this expenditure I have included payment of boats and bandies for carriage of provisions to the nearest depôt. See Statement E, as also that portion of the permanent establishment which falls to this branch of the department according to Table D.

8. I also beg to observe that the expenditure shown is not the actual payment, but the amount which should have been paid according to returns. *Par example*, a day book shows a total of 500 rupees, of which only 250 rupees have been paid; then have I debited the work with the whole of 500 rupees, which are actually due.

	<i>Rs.</i>
9. The total purchases during the half-year amounted to	74,015
The total sales to	65,548
Making a grand total of	1,39,563
With a total expenditure of	12,683, or 9.08 per cent.
And exclusive of permanent establishment of	4,470 = 5.88 per cent.

10. If we compare this with the proceedings of 1864-65, we will have as follows:

	<i>Rs.</i>
Total expenditure on sales and purchases (half of 30,537 rupees)	
during 1864-65	15,268
Ditto during half-year 1865-66	12,683
Or a saving of	2,585
Again, per-centage during 1864-65	8.74 and 6.01
Corresponding with 1865-66	9.08 and 5.88
Or—0.34, and + 0.13	

11. The per-centage has apparently not materially changed, while still a saving of 2,585 rupees has been effected. This is explained by the smaller number of workpeople to be provided for. With the present establishment considerable more work can be performed, notwithstanding it will not allow of a further reduction.

12. Herewith will I close my remarks on the supply branch; but at the close of this official year I will forward a full statement of all purchases and sales in detail, profits and losses, and how far the former have covered the expenditure, with every other information necessary.

B.—TRANSPORT AGENCY.

13. This includes both river and tramway; the former again being divided in 1st reach and 2nd reach.

14. The flotilla employed in the river transport underwent a material change in so far that two steamers were taken off, and three new boats taken on.

15. The "Queen" was one of those steamers; her boiler was pronounced unsafe, and she was therefore dismantled. The steamer "Hope" was the other one; one of her boilers had been burnt through, and she was consequently useless.

16. The three new boats added to the fleet were built at the Government workshop here, and have done good service. They carry 35 tons each.

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P

17. The

17. The working fleet consisted therefore, and was distributed as follows :—

1st.—Reach Steamer “Prince”—

Flats of 52 tons each = 6 (5 decked).
Open boats of 70 tons = 2
Ditto of 55 tons = 3

2nd.—Reach Steamer “Arther Cotton”

Ditto - “Shamrock”
Ditto - “Rose”—
Boats of 50 tons each = 2
Ditto of 40 „ = 1
Ditto of 30 „ = 10

18. The steamer “May Flower,” and one boat of 30 tons in the 4th reach, above the 2nd barrier, were inactive, and the “Trevelyan” was transferred to the 1st reach, to be used as a store-ship.

19. It will be observed that the tonnage of boats differs from that reported formerly, namely :—

										Tons.		
6	flats	of	80	tons	are	stated	to	be	-	-	-	55
2	boats	of	80	"	"	"	"	"	-	-	-	70
2	"	of	45	"	"	"	"	"	-	-	-	50
1	"	of	50	"	"	"	"	"	-	-	-	40
11	"	of	45	"	"	"	"	"	-	-	-	30

and this has been done, as the boats will only carry burdens as now reported.

20. The steamer “Rose” was transferred to the 1st reach with the last fresh, to secure communication with the coast during the dry season, and therefore her name appears in Statement B, in both reaches.

(1.)—1ST REACH.

21. The steamer “Prince” performed all the work between Dowlaishwarum and Golagoodium, and did nearly twice as much as all the other steamers combined.

22. Some urgent repairs to her bottom obliged me to have her put on the stocks after the freshes of 1864–65, and she was not afloat again until the 15th June 1865; however, beyond towing a few engineer stores from Roodramcottah to Golagoodium, she did not commence actual operations until the 13th July, owing to the delay which was experienced in bringing our heavy boats from Coconada, where they had undergone repairs, *viâ* the Samulcottah channel, to Dowlaishwarum.

23. Had this unfortunate delay not occurred, I am confident that the rate of carriages would have been but a trifle over 6 pie or $\frac{1}{2}$ anna per ton per mile.

24. The goods carried or towed by the “Prince” consisted in the greater part of provisions for this Department, and limestone from Rajahmundry quarries, for the Engineer’s Department. The number of passengers was considerable, but the quantity of private stores small; the sum of 2,300 rupees, realised on the two latter, more than covered all expenditure on fuel.

25. The “Rose,” after having been transferred to the 1st reach, was solely employed in the carriage of cut and rubble stone from the Davarapilly Fort to the Tail Locks at Soddarum, and was only put on the line between Dowlaishwarum and Golagoodium after the “Prince” discontinued running in the beginning of December.

26. From the detailed statement B, it will be seen that the quantities carried were as follows :—

							Tons.
Total	Engineer	Stores,	one	mile	=	-	59,026
„	Transport	„	„	=	-	-	113,554
„	Private	„	„	=	-	-	3,912
Making a grand total of							176,492 tons carried one mile.

The total cost on this carriage amounted to 13,004 rupees, which gives the rate per ton per mile at 1.17, annas that is, if passengers are not taken into account; if we, however, allow the earnings of the steamer on account of private goods and passengers to be deducted, we will have - - - - -

							Rs. 13,004
Less	-	-	-	-	-	„	2,300
Equal to	-	-	-	-	-		Rs. 10,704

Or 11.64 pie per ton per mile.

27. These results, compared with those reported for 1864-65, will show as follows:—

	Rs.
Expenditure for half-year 1864-65 (half of 55,095 rupees) - - - - -	27,547
„ for „ 1865-66 - - - - -	13,004
Which gives a saving of - - - - -	14,543
Again, carriage per ton per mile during 1864-65 = As.1.75 or pice	20.76
„ „ „ „ „ 1865-66 = - - - pice	11.64
Or a reduction in the ton per mile of pice - - - - -	9.12

28. This favourable result has been obtained by—

- Keeping the steamer “ Prince ” not an hour idle from the date of starting.
- By having all stores necessary for the consumption at the works ready, and carried during the freshes instead of during the dry season, as last year, when a sum of about 24,000 rupees was expended in boat hire alone.
- The exertions of Captain Barber, in charge of flotilla in the 1st reach.

29. I think it decidedly doubtful whether the result for 1866-67 will be as favourable as this season, as no preparations whatever have been made for the purchase and storage of provisions required for that year, through which the steamer will be idle during the greater part of the freshes.

I, in my No. 934 of 12th October, pointed out how a saving in the purchase of grain could be effected; but as the local Government did not sanction my proposition I was excluded from carrying out such plans, which would have much assisted in the economical management of the supply branch, as well as the river transport.

(2.)—2ND REACH.

30. The “ A. Cotton ” was the only steamer ready for work in this reach when the freshes set in in June last. The “ Rose,” on the stocks at the 2nd barrier, had to be floated and brought down, and the “ Shamrock,” which had been the dispatch boat during the dry season of 1864-65 in the 1st reach, had to be brought over the barrier, so that only a fair start for work was made in the beginning of July.

31. Another delay occurred towards the end of July, by the steamer “ Shamrock ” striking a rock and sinking in eight feet of water. Eleven days elapsed before we were able to raise and repair her, and the boats necessarily required to do so had to be taken off the line. We lost, therefore, the services of one steamer and six boats for a considerable time.

32. The goods carried in this reach consisted in a greater part of limestone from the Boomalunka quarry and cut stone from the Manoogoor quarry; we also took up to the 2nd barrier such telegraph stores which had not been taken over by the contractor, and despatched on different occasions special steamers to the 2nd barrier for the transport of travellers.

33. As already stated, Table B. shows the performances of each steamer, a total of which is as follows:—

	Tons.
Engineer stores carried one mile - - - - -	89,506
Transport „ „ - - - - -	332
Other „ „ - - - - -	3,099
Or a grand total of stores carried one mile - - - - -	92,937

the total cost of which amounted to 9,276 rupees, or at the rate of 1.59 annas per ton per mile; that is, if the income on passengers, private stores, &c., is not taken into consideration: allowing for the same, we have a total expenditure of - - - Rs. 9,276

Less income of - - - - - Rs. 2,212

Cost of carriage of Government stores - - - - - Rs. 7,064
or at the rate of 1.21 annas per ton per mile

34. This compared with the expenditure and rate of 1864-65, we will have—

	Rs.
Expenditure for half-year (half of 15,611 rupees) 1864-65 - - -	7,805
„ „ „ 1865-66 - - -	9,276
Or an increase of - - - - -	1,471
Again, rate of carriage, 1864-65 - - - - -	2.78
„ „ 1865-66 - - - - -	1.21
Or a reduction in one ton per mile of annas - - - - -	1.57

35. The apparent discrepancy of showing a decrease of more than the total cost in rate this season with an increase of of 1,471 rupees in expenditure is explained by the quantities quarried in 1864-65; the quantity carried during the whole season amounted to 87,008 tons carried one mile, at a total cost of 15,611 rupees; while during the half-year of 1865-66 the quantity carried amounted to 92,937 tons one mile, at a cost of 9,276 rupees only.

36. Before concluding my remarks on the river transport, however, I beg to point out that the rates now given will slightly increase by the end of this official year, as nearly all the steamers will be in ordinary for some months, and, while the expenditure for maintenance, however small, is going on, no progress is made. Supposing even that the rates should increase 25 per cent., which I am certain is far too much, even then I have every reason to believe that the proceedings of this branch of the Department in particular will have given entire satisfaction.

(3.)—TRAMWAY.

37. The goods carried by this means consisted chiefly of all sorts of provisions and engineer stores landed at Golagoodium by the steamers, and materials for work; and it is now the only road by which the many labourers at Doomagoodium and adjacent works can be supplied with food.

38. Every attention has been paid to its complete and uniform working; the stations, formerly numbering five, have been reduced to three, namely, Golagoodium, Toorbaka (midway, and Doomagoodium, and the trains, which formerly passed two days on the road before reaching either end station, complete the journey now in about eight hours; horse drivers are only kept at Golagoodium and Doomagoodium, while the relay station at Toorbaka has one horse-keeper to every three horses, who stays there, and only furnishes the trains on their arrival with fresh horses; and, notwithstanding all this, the rate has considerably increased, while the expenditure has been reduced more than 25 per cent.

39. The progress of the tramway (C.) will be seen to be as follows:—

Engineer stores, &c., carried one mile	-	-	-	-	-	=	Tons.	6,931
Transport stores - ditto	-	-	-	-	-	=		10,783
Private and others - ditto	-	-	-	-	-	=		1,143
Total carried one mile								18,857
At a total cost of							Rs.	7,212

Or at the rate of 6·11 annas per ton per mile, exclusive of passengers; and if allowing for the latter, or, better said, if allowing the actual income on private goods and passengers to be deducted, we have—

Total cost	-	-	-	-	-	-	=	Rs.	7,212
Less income	-	-	-	-	-	-	=		754
Actual cost on carriage of Government stores									6,458

Or at the rate of 5·47 annas per ton per mile.

40. Compared with last year's operations we find—

							<i>Rs.</i>
Expenditure for half-year, 1864-65	-	-	-	-	-	=	11,196
" " 1865-66	-	-	-	-	-	=	7,212
Or a reduction of expenditure of							3,984
							<i>Rs.</i>
Again, rate of carriage during 1864-65	-	-	-	-	-	-	3·60
" " during the half-year 1865-66	-	-	-	-	-	-	5·47
Or an increase of rate per ton per mile of							1·87

41. The only reason why the rate has increased can be found in the smaller quantity of goods carried, and this is caused by the tramway being in a very bad state for half the distance, so that only about half the quantity can be carried than else would have been the case, by the interruption of all traffic for some weeks during the rains, and by the quarry at Nursapoor, whence we formerly brought a large quantity of cut stone for the works, being discontinued.

42. Allowance should further be made for the uncertainty of materials and stores, which have to be carried for the works, and on account of which a number of spare cattle have to be kept on hand, which, if done away with, would certainly reduce the cost of establishment,

blishment, but also so cripple the department that, on a sudden call, it would be unable to perform its duties.

C.—SUMMARY.

43. The total quantities carried by water with their respective costs in the 1st and 2nd reach, we will find as follows:—

1st reach, tons, one mile	-	-	-	176,492	Cost Rs. 13,004
2nd ditto - ditto	-	-	-	92,937	„ 9,276
Grand Total	-	-	-	269,429	„ 22,280
Or 1'32 annas per ton per mile.					
And including land carriage, we have					
water-carriage one ton one mile	-	-	-	269,429	Cost Rs. 22,280
Land carriage - ditto	-	-	-	18,857	„ 7,212
Or a Grand Total of all carriage	-	-	-	288,286	= Rs. 29,412

Or at the rate of 1'63 annas per ton per mile, which, compared with the progress of 1864-65, will give the following result:—

					<i>Tons.</i>
Total tonnage for the half year 1864-65 (half of 635,209)	-	=			317,604
Ditto - ditto - 1865-66	-	-	-	-	288,286
Carried less one mile	-	-	-	=	29,318
					<i>Rs.</i>
Total expenditure of the half-year 1864-65 (half of 93,099 rupees)	=				46,459
Ditto - ditto - 1865-66	-	-	-	-	29,412
Expended less, and saved	-	-	-	=	17,137
					<i>Rs.</i>
Rate of carriage in 1864-65	-	-	-	-	2'34
Ditto - ditto - 1865-66	-	-	-	-	1'63
Rate reduced on the total by	-	-	-	=	0'71

D.—CONCLUSION.

44. Every exertion was made by all connected with the department to work as economically as possible, and I think I am justified in saying that the result testifies to the same. A saving has been effected of 37 per cent. on the total expenditure for the same time in 1864-65; the rates of the river transport have been very much reduced, and the department is as near as possible perfect and complete in its working, which the work performed clearly indicates. I hope, therefore, that the department has given satisfaction, and that such may be acknowledged by increasing the small salaries of Captain Barber, in charge of the flotilla in 1st reach, and Mr. Thompson, Sub-overseer.

45. The references to former proceedings have been taken from my Report, No. 906, dated 6th October 1865.

[illegible]

Doomagoodien, Transport and Supply Office, }
17 January 1866.

*J. F. Stoddard, Major,
Offg. Supdg. Engr., Nagpoor Circle.*

E. De Gronsilliers,
Acting Exe. Engr., Transport and Supply Division, Upper Godavery Ctdle.

(B.)

MEMORANDUM of Progress of RIVER TRANSPORT, from 1st May to 31st October 1865, of Steamers on Tow, *Upper Godavery.*

Name of Steamers.	Particulars of Freight received.	Miles Towed.								Passengers.	Total Miles Run.		Total Engineer Stores, One Mile.	Total other Depart-ment or Private Stores, One Mile.	Total Transport Stores, One Mile.	Total Passengers.	Total Miles Run.
		3½	6	16	24	36	75	87	91	96	105	120					
Prince - 1st Reach -	Engineer Stores and Stores for } Tons	-	-	-	64	6	-	206	392	26½	-	-	57,890	-	-	-	-
	Works - - - - -	-	-	-	-	-	-	-	-	752	102½	255	-	-	113,554	-	-
	Transport Stores, Provisions, &c. "	-	-	-	-	-	-	-	-	29½	-	9	-	3,912	-	-	-
	Other Department and Private Stores, "	-	-	-	-	-	-	-	-	-	-	-	-	-	-	869	-
Rose - 1st Reach -	Passengers - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,873
	Miles run - - - - -	-	-	-	-	-	-	-	-	-	-	-	1,955	-	-	-	-
	Engineer Stores - - - - -	256	-	-	10	-	-	-	-	-	-	-	1,156	-	-	-	-
	Transport Stores - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rose - 2nd Reach -	Other Department Stores - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Passengers - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Miles run - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-
		256	-	-	74	6	-	206	392	808	102½	264	2,089½	3,912	113,554	889	4,336
Hope - 2nd Reach -	Engineer Stores - - - - -	-	-	365	882	-	-	-	-	-	-	-	27,008	-	-	-	-
	Transport Stores - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Other Department - - - - -	-	-	-	-	-	35	-	-	-	-	-	-	2,625	-	46	-
	Passengers - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,911
Shamrock - 2nd Reach -	Miles run - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-
	Engineer Stores - - - - -	-	-	517	844	-	-	-	-	-	-	-	-	-	-	-	-
	Transport Stores - - - - -	-	-	-	9½	-	-	-	-	-	-	-	-	-	32	-	-
	Other Department - - - - -	-	-	-	1	-	-	-	-	-	-	-	-	24	24	-	-
Arthur Cotton - 2nd Reach -	Passengers - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Miles run - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Engineer Stores - - - - -	135	460	-	1,071	-	-	-	-	-	-	-	33,874	-	-	-	-
	Transport Stores - - - - -	-	-	-	2	-	-	-	-	-	-	-	-	-	48	-	-
Arthur Cotton - 2nd Reach -	Other Department - - - - -	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-
	Passengers - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	97	-
	Miles run - - - - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		135	1,345½	-	2,809½	-	41	-	-	1	-	-	89,506	3,099	332	180	7,134

(C.)

MEMORANDUM of Progress of TRAMWAY between *Gollagoodiem* and *Doomagoodiem*, from 1st May 1865 to 31st October 1865.

Particulars of Freight received.	Miles carried.					Total Engineer Stores, One Mile.	Total Transport Stores, One Mile.	Total other Department or Private Stores, One Mile.	Total Passengers.	REMARKS.
	7	9	10	4	No.					
Beer Stores, up - - - - -	14	95	40	-	-	1,353	-	-	-	
Port " " - - - - -	-	451	459	-	-	-	8,649	-	-	
Department or Private Stores, up - - -	-	39	28	-	-	-	-	631	-	
gers - - - - -	-	-	-	-	155	-	-	-	155	
Beer Stores, down - - - - -	-	262	322	-	-	5,578	-	-	-	
Port " " - - - - -	-	56	71	230	-	-	2,134	-	-	
Department " - - - - -	-	28	26	-	-	-	-	512	-	
gers " - - - - -	-	-	-	-	203	-	-	-	203	
	14	931	946	230	358	6,931	10,783	1,143	358	

magoodiem, Transport and Supply Office,
17 January 1866.

J. F. Stoddard, Major,
Offg. Supdg. Engr., Nagpoor Circle.

E. DeGronsilliers,
Acting Exec. Engr., Transport and Supply Division.

(D.)

MEMORANDUM of Permanent Establishment employed in TRANSPORT and SUPPLY DIVISION, *Upper Godavery Circle*, during the First Half-year of 1865-66.

DESIGNATION.	Rate of Pay.	For what Period, in Months.	To what Branch Chargeable, and how much.		Division of Transport Service.		
			Supply.	Transport.	Tramway.	1st Reach.	2nd Reach.
Superintendent - - - - -	<i>Rs.</i> 600	6	<i>Rs.</i> 1,800	<i>Rs.</i> 1,800	<i>Rs.</i> 600	<i>Rs.</i> 600	<i>Rs.</i> 600
Assistant Superintendent - - - - -	250	6	750	750	-	750	-
Overseer - - - - -	180	6	540	540	270	270	-
Commander - - - - -	200	6	-	1,200	-	1,200	-
Ditto - - - - -	150	4	-	600	-	1,800	180
Mechanical Engineer - - - - -	300	6	-	1,800	400	400	400
Sub-Overseer - - - - -	60	6	180	180	-	-	-
Establishment and Contingencies - - -	400	6	1,200	1,200	-	-	-
			4,470	8,070	1,270	5,020	1,180

magoodiem, Transport and Supply Office,
17 January 1866.

J. F. Stoddard, Major,
Offg. Supdg. Engr., Nagpoor Circle.

E. DeGronsilliers,
Acting Exec. Engr., Transport and Supply Division.

(E.)

MEMORANDUM of CARRIAGE of PROVISIONS from Place of Purchase to nearest Depôt, for the First Half-year of 1864-65.

Particulars of Freight received.	Miles Carried.								Total Tons carried One Mile.	REMARKS.
	10	12	16	17½	25	32	49	128		
									Transport Stores.	
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	
Port Stores, Provision, &c. - - -	44	120	39	111	29	369	29	43½	23,883	Cost <i>Rs.</i> 2,883, or as. 1'89 per ton per mile.

magoodiem, Transport and Supply Office,
17 January 1866.

J. F. Stoddard, Major,
Offg. Supdg. Engr., Nagpoor Circle.

E. DeGronsilliers,
Acting Exec. Engr., Transport and Supply Division.

Enclosure 3, in No. 13.

(No. 423 c., dated 10 May 1866.)

From Lieutenant Colonel *C. H. Dickens*, B. A., Secretary to Government of India, Public Works Department, to Chief Commissioner of Central Provinces.

I AM directed to acknowledge receipt of your Secretary's letter, No. 181—7473, dated 12th April 1866, forwarding Progress Report of the Godavery Works for the half-year ending 31st October 1865, and in reply to notice with commendation the exertions of the Transport and Supply Department.

2. With reference to the remarks made by the Officiating Superintending Engineer of the Nagpore Circle, in regard to the excessive cost of the masonry work, the Governor General in Council observes that it would be but fair to allow the executive engineer who was in charge of the works an opportunity of replying to the implied censure on his management; and I am accordingly to intimate that Mr. Isaac will be called upon, through the Government of Bengal, for any explanation he may have to offer on the subject.

3. The Progress Report will be forwarded to the Secretary of State.

— No. 14. —

EXTRACT, PUBLIC WORKS DESPATCH to the Government of India,
dated 9 November (No. 70) 1866.

Letter dated 10th
May, No. 71, of
1866.

Para. 5. THE small amount of progress made with the Godavery Navigation Works during the quarter under review is satisfactorily accounted for, but no reason has been assigned for the high cost of the masonry works, which have exceeded the estimates by 50 per cent. I observe, however, that you have called upon the executive engineer for any explanation he may have to offer on the subject.

6. The operations of the Transport and Supply Department appear to have been carefully and economically conducted, and reflect credit on the exertions of the Acting Superintendent.

— No. 15 —

PUBLIC WORKS DESPATCH to the Government of India, dated 7 December
(No. 74) 1866.

1. IN continuation of my predecessor's Despatch, No. 26, of 4th June last, I have to acquaint you that, at the recommendation of Major Haig, arrangements have been made for the provision of three steam tugs and six barges for use on the River Godavery.

2. Articles of agreement entered into with Messrs. Randolph, Elder & Co., for the supply of these vessels are herewith transmitted.

(signed) *Cranborne.*

— No. 16. —

(No. 185, Public Works.—Government of India.—Public Works Department.)

To the Right Honourable the Secretary of State for India.

My Lord,

Fort William, 19 December 1866.

Civil Works—
Communications.

IN continuation of our letter, No. 71, dated 10th May 1866, we have the honour to forward the accompanying copy of the Progress Report of the Godavery Works for the half-year ending 30th April 1866.

2. This

2: This document was originally submitted in August 1866, but as there were several discrepancies between the statements attached to it and the previous Half-year's Report, it was returned to the Chief Commissioner of the Central Provinces for correction or explanation. A revised abstract of the Progress Report has now been submitted, and this, with the earlier letter from the Chief Commissioner, and the Report of the Transport and Supply Department, are forwarded for the information of Her Majesty's Government.

We have, &c.
(signed) *John Lawrence.*
H. S. Maine.
W. Grey.
G. N. Taylor.
W. N. Massey.
H. M. Durand.

Enclosure 1, in No. 16.

(No. 157—1993, dated 14 August 1866.)

From Colonel *W. Maxwell*, R. A., Secretary to Chief Commissioner of Central Provinces, in the Public Works Department, to Secretary to Government of India, Public Works Department.

I AM directed to forward the following papers, being the Second Half-yearly Progress Report, ending 30th April 1866, on the Upper Godavery Works:—

Progress Report, by Lieutenant Roberts, Executive Engineer, Upper Godavery Works.

Abstract of Works.

Five tracings showing the state of works.

Acting Superintendent of Transport and Supply Department Report, No. 379, dated 23rd July, on the operations of his department.

2. In submitting these papers the Chief Commissioner would observe that progress in general has been as satisfactory as financial means permitted. The anicut has not been proceeded with during the half-year, as all available workmen were put on the canal at Doomagoodium and the head-lock, as it was considered of far more importance to complete these works before anything more was done to the anicut, in order to open out the navigation at the 1st barrier at the earliest possible date.

3. The budget provision for the Godavery Works during 1865-66 amounted to 3,91,800 rupees, and the expenditure to 4,74,997 rupees; the excess is due to a number of items having, during the year, been removed from the Miscellaneous Advance Account.

Enclosure 2, in No. 16.

(No. 379, dated 23 July 1866.)

From *J. H. Dennison*, Esq., Acting Superintendent, Transport and Supply Department, to Superintending Engineer, Nagpoor Circle.

I HAVE the honour to submit the following report of operations in the Transport and Supply Division, Upper Godavery Works, for the half-year ending 30th April 1866-67, prepared from the yearly report of the late superintendent, as requested by you in your No. 56—1091 of 27th ultimo.

2. The operations of the division during the half-year are similar to those of the preceding half-year, ending 30th October 1865-66, viz. :—

A.—Carriage of provisions, of engineer stores and other stores, as well as passengers. This is styled the Transport Service, and is divided into River and Land Transport; the former being two branches, viz., 1st and 2nd Reach.

B.—Purchases, storage, and retail of provisions for the labourers on the works constitute the Supply Branch.

3. The following table will show the cost of the permanent establishment employed during the half year, and the portions chargeable to the Transport and Supply Branches:—

	Permanent Establishment.	Transport.	Supply.
	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
1 Superintendent, for six months, at Rs. 600 - - -	3,600	1,800	1,800
1 Assistant Superintendent, at Rs. 250 - - -	1,500	750	750
1 Commander, Flotilla, 1st Reach, at Rs. 200 - - -	1,200	1,200	—
1 Mechanical Engineer, 1st Reach, at Rs. 300 - - -	1,800	1,800	—
1 Overseer, 1st Reach, at Rs. 180 - - -	1,080	540	540
1 Sub-Overseer, 1st Reach, at Rs. 60 - - -	360	180	180
Office Establishment, 1st Reach - - -	2,550	1,275	1,275
TOTAL - - - Rs.	12,090	7,545	4,545

4. The cost of the permanent establishment chargeable to the Transport Branch, is again to be sub-divided, as follows:—

	<i>Rs.</i>
1st Reach, River transport - - - - -	5,045
2nd „ - ditto - - - - -	1,205
3rd „ Land transport (tramway) - - - - -	1,295
TOTAL - - - Rs.	7,545

5. The permanent establishment, as a general rule, is not added to the charge against the works; but, in order to come to a correct conclusion of the actual cost and rate of carriage per ton per mile, I will add it as chargeable to its respective heads:—

A.—SUPPLY.

6. Important changes have taken place in this branch, as the selling price of rice, our staple article, was raised and sold at 12 seers per rupee, instead of 16 seers; the supply and retail of condiments were given over entirely to contractors, and the per-centage paid for retailing rice lowered from 6½ to 4 per cent.

7. Important as these changes doubtless are in reducing expenditure, and raising value of stock in hand, still it is doubtful whether they will suffice to cover every expenditure, actual losses, deterioration of certain damaged stores, all of which have been added since the existence of the department to stock value by the controller, the more so as the Buster country supplies are but a trifle, and the rates at the coast are now higher than they have been for a long time.

8. The cash transactions in this branch, during the half-year ending 30th April 1866-67, showed as follows:—

Total Purchases, in round sum - - - - -	<i>Rs.</i>
„ Sales - - - - -	23,501
„ Transfers - - - - -	65,686
	7,150
GRAND TOTAL - - - Rs.	96,337
Expenditure thereon—	<i>Rs.</i>
Permanent establishment - - - - -	4,545
Temporary „ - - - - -	1,796
Labour and materials - - - - -	3,930
Carriage - - - - -	1,598
GRAND TOTAL - - - Rs.	11,869

or 12·3 per cent., inclusive of permanent establishment, and 7·6 per cent. excluding the same. This, compared with the proceeding of the past half-year, ending 31st October, will show as follows:—

	Total Sales, Purchases, &c.	Total Expenditure.
	<i>Rs.</i>	<i>Rs.</i>
Half-year ending 31 October 1865 -	1,39,563	12,683 = 9·08 per cent.
„ 30 April 1866 -	96,337	11,869 = 12·3 „
Less - - -	43,226	814 = 1·8 per cent.

9. The difficulty the department had to overcome in 1864-65, namely, in sending about 18,000 bags of rice during the dry season was avoided; no reliance being placed on supplies coming in from the Buster country, and provided everything from the coast during the freshes. Through it was saved much expenditure and trouble. The supplies received from Buster amounted only to about half month's consumption, and consequently again an utter failure.

10. The outstanding advances on Brinjaries are slowly collecting; the loss, if any, will be small, but it will take time and trouble to collect all.

B.—TRANSPORT.

11. This branch of the department is again divided into River Transport and Land Transport; the former will be divided into Reaches.

RIVER TRANSPORT.

12. The flotilla employed consisted of steamers and boats distributed as follows:—

1st Reach, viz., that between Dowlaisweram and the 1st barrier, distance 96 miles—

Steamer "Prince."	Boats—2 of 70 tons each.
" "Rose."	" 6 of 50 "
" "Fawn."	" 3 of 35 "
" "Trevelyan."	

2nd Reach, viz., that between 1st barrier and 2nd barrier, distance 85 miles—

Steamer "Arthur Cotton."	Boats—2 of 50 tons each.
" "Rose."	" 1 of 40 tons.
" "Shamrock."	" 10 of 30 tons each.

3rd Reach, viz., that between 2nd and 3rd barriers—no steamers or boats.

4th Reach, viz., that above 3rd barrier—

Steamer "May Flower"	} in ordinary.
Boat—1 of 30 tons	

13. From the enumeration of the whole fleet, it will be seen that two steamers are not mentioned, and that three boats of 35 tons have been added. The steamers omitted are the "Hope" and "Queen"; the former useless, one boiler having burst, and the latter entirely condemned. The three new boats were built at the workshop at Doomagoodium, and have proved a great acquisition, as they draw, laden with 20 tons, only two feet.

1ST REACH.

14. The most useful steamer of the whole fleet is the "Prince," as she tows up more stores and provisions than the whole of the other steamers together. In a moderate fresh, and with good boats, she is capable of towing up to 150 tons against stream. She was running till November, or more than five months, drawing 3 feet 10 inches water.

The "Rose," during the fresh, was employed in the 2nd Reach; but, with the last fresh, was brought down the barrier, and transferred to 1st Reach to take "Prince's" place after she discontinued running. The "Rose" was put in stocks for repair towards the end of February 1866, having run more than eight months, drawing about 2 feet 6 inches water.

The "Fawn" was handed over to this department by executive engineer, 1st Division, in the month of December last. She is now used as a dispatch-boat, particularly to bring up treasure. She was running in May, and took up 25,000 rupees at the end of that month. She remains at Koydah, 60 miles above Dowlaisweram, or 92 miles from the sea, as the shoals in the months of April and May have too little water to allow her to pass over with dispatch. The river is unusually low this year.

15. The freight brought up consisted chiefly of provisions, materials and stores, and treasure for the works, a small quantity of private stores, and passengers and labourers. The freight down amounted to but very little.

16. The steamers carry but little on board; all freights are towed up by them in boats or flats. They carried up during the half-year:—

Departmental stores and provisions	-	-	30,776 tons one mile.
Engineer stores and materials for works	-	-	10,827½ " "
Private and other stores	-	-	2,933½ " "
Total tons per mile	-	-	44,537

Passengers, one mile	-	-	-	-	-	-	-	50,900
Workmen	-	-	-	-	-	-	-	4,850
Horses	-	-	-	-	-	-	-	288

The total expenditure during the half-year in 1st Reach is as follows:—

								<i>Rs.</i>
Permanent establishment	-	-	-	-	-	-	-	545
Temporary ditto	-	-	-	-	-	-	-	198
Labour and materials	-	-	-	-	-	-	-	6,442
Total	-	-	-	-	-	-	-	7,185

17. From this the income, 1,553 rupees, is to be deducted, which leaves actual expenditure of 5,632 rupees for the carriage of—

Departmental stores	-	-	-	-	-	30,766 tons one mile.
Engineers' - „	-	-	-	-	-	10,827½ „ „

or of a total of 41,603½ tons and 4,850 workmen one mile.

18. Calculating at the rate of three pice per man per mile, the usual rate for third class passengers, it comes to 76 rupees; if this sum is deducted, there remains a balance of 5,556 rupees net expenditure on 41,603½ tons, giving a rate of 2½ annas per ton per mile. This, compared with the past half-year, shows as follows:—

	Total Tons carried one Mile.	Total Expenditure.	Rate per Ton per Mile.
		<i>Rs.</i>	
Half-year ending 30th April 1866	41,603½	5,556	2½ annas.
„ 31st October 1865	172,580	10,704	11.64 pice.
Carried less	130,976½	5,148	7 pice.

2ND REACH.

19. There has been no work done in this reach since the 31st October, so the progress reported during that half-year was all that was performed. The expenditure on permanent establishment, and maintenance of steamers and boats, for the half-year ending 30th April, is as follows:—

								<i>Rs.</i>
Permanent establishment	-	-	-	-	-	-	-	1,505
Temporary ditto	-	-	-	-	-	-	-	93
Labour and materials	-	-	-	-	-	-	-	4,011
Total	-	-	-	-	-	-	-	5,609

TRAMWAY.

20. This permanent tramway commences at Gollagoodium, the general landing-place for all steamers and boats, and ends at Doomagoodium, a distance of 19 miles.

21. Regular trains start every morning from Gollagoodium and Doomagoodium, and meet at Toorbacca (midway), a relay station, carrying greater part of provisions from Gollagoodium stores to Doomagoodium for the workpeople, as also stores and materials for the works. The wagons are drawn by ponies or bullocks, of which we have about 90. The Toorbacca station is, as already stated, a relay station, furnishing the trains with fresh cattle. The drivers from Gollagoodium do not go on with the trains to Doomagoodium, but return with the Doomagoodium trains to Gollagoodium, by which arrangement each train reaches its destination in about eight hours, and always brings the drivers to their houses.

22. At Gollagoodium and Doomagoodium, one man is kept for each pony; but at Toorbacca, where the horse-keepers are stationary, one man has to look after three ponies.

23. The work performed by this means of locomotion is as follows:—

								<i>Tons.</i>
Stores and provisions carried one mile	-	-	-	-	-	-	-	21,220
Stores and materials for works	-	-	-	-	-	-	-	2,675
Private stores	-	-	-	-	-	-	-	2,562
Total tons carried one mile	-	-	-	-	-	-	-	26,457

24. Besides this, 6,587 passengers were carried one mile.

25. The

25. The expenditure on this carriage shows as follows :

								Rs.
Permanent establishment	-	-	-	-	-	-	-	1,295
Temporary ditto	-	-	-	-	-	-	-	616
Labour and materials	-	-	-	-	-	-	-	5,887
Total	-	-	-	-	-	-	-	7,798

26. From this, the income on 2,562 tons, private stores, and 6,587 passengers, equal to 663 rupees, so that 7,135 rupees will be an equivalent to 23,895 tons carried one mile, or at the rate of annas 4½ per ton per mile.

27. If we compare this with the operation of the past half-year, we have as follows :—

		Total Tons Carried.	Expenditure.	Rate per Ton per Mile.
			Rs.	
Half-year ending 30th April 1866	- -	23,895	7,135	4.75 annas.
„ 31st October 1865	- -	17,714	6,468	5.47 „
Carried more	- -	6,181	677	0.72 „

28. By this it is evident that rate and expenditure was decreased, and doubtless would have been more favourable had the tramway been in good order.

29. The tramway is in a miserable condition between Gollagoodium and Toorbacca, and six bags of rice in a wagon are all that a pony can drag along ; while, on the other hand, if the tramway was in good order, 10 bags would be carried with ease.

30. Gram has risen in price 25 per cent., and thereby adds considerably to the expenditure.

31. As a rule, about 15 pairs of bullocks have been idle for want of work ; these add to expenditure showing no progress.

32. The carriage by tramway will always be expensive, till such time as the tramway is thoroughly repaired, and rails covered over with bar-iron.

Enclosure 3, in No. 16.

(No. 800 C, dated 1st September 1866.)

From Lieutenant Colonel C. H. Dickens, R.A., Secretary to Government of India, Public Works Department, to Chief Commissioner of Central Provinces.

I AM directed to acknowledge receipt of your Secretary's letter, No. 157—1993, dated 14th August 1866, forwarding Progress Report of the Godavery Works for the half-year ending 30th April 1866.

2. It is observed that the tabular statement accompanying the report is prepared in a different form from that of the previous half-year, and does not agree with it in several of the items. Thus in the statement submitted for the half-year ending 31st October 1865, the amount of earth-work, reported done in the first section of the canal up to date, was stated to be 8,609,479 cubic feet, at a cost of 65,185 rupees. In the statement now submitted, the amount entered is 4,805,550 cubic feet, at a cost of 38,325 rupees. If these figures are correct, the amount of earth-work done to end of half-year under review should be 13,415,029 cubic feet, at a cost of 1,03,510 rupees, instead of 8,187,775 cubic feet, at a cost of 75,057 rupees as entered.

3. Again, the amount of work in the estimate for this item is entered in the present statement at 503,525 cubic feet less than in the previous one, though the estimated cost is the same in both.

4. The cost up to date of items 1, 3, 4 and 5 does not in any one case equal the sum of the reported expenditure to 31st October 1865, and that stated to have been incurred during

during the subsequent half-year; and in item 1, the amount of work differs in a similar manner from what it apparently should be.

5. I am accordingly directed to return the report, and to request that it may be re-submitted with an explanation of the discrepancies pointed out above, or any corrections which may prove on inquiry to be necessary. The statement for the past and future half-years should be prepared in the form of which a sample accompanies, and which is merely a slight extension of the form used in the half-year ending 31st October 1865.

6. The Governor General in Council also desires me to take this opportunity of drawing attention to the rates for masonry, both during the past half-year and up to date. The rate for earth-work on the first section of the canal appears to be 8·5 per cent. less than that in the estimate, while the average rate for masonry in anicut, sluice-wall and head-lock taken together is 29·66 per cent. in excess of the estimate, and the rates on both anicut and sluice-wall have been very high. The quantity of work done on these is, however, very small, and the high rate in these cases does not seriously affect the general average.

7. The early submission of the corrected Progress Report is requested.

Enclosure 4, in No. 16.

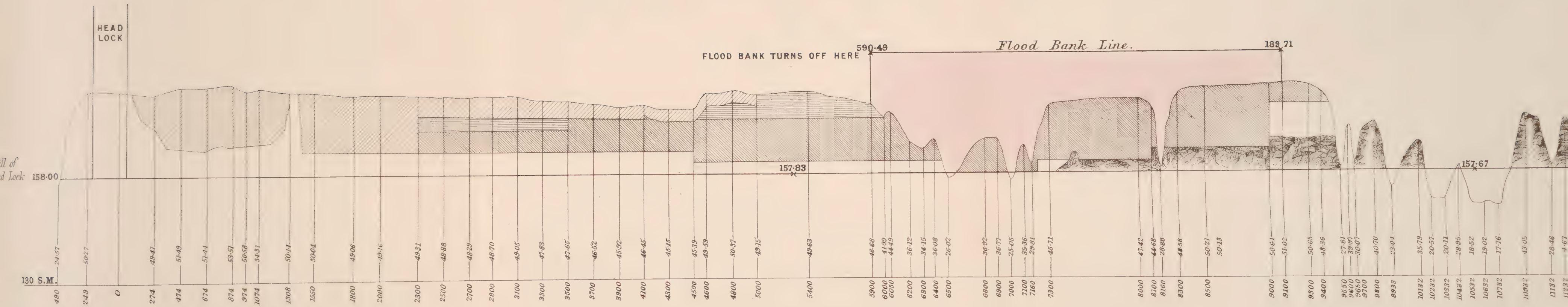
(No. 320—3680, dated 22nd November 1866.)

From Colonel *W. Maxwell*, R. A., Secretary to Chief Commissioner of Central Provinces, in the Public Works Department, to Secretary to Government of India, Public Works Department.

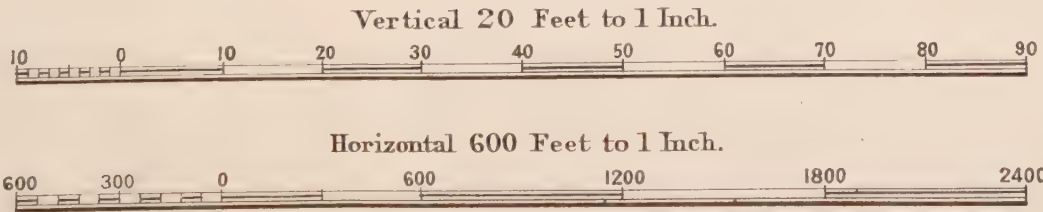
WITH reference to your office No. 800 C., dated 1st September last, I am directed to forward, in original, a revised Abstract Progress Report of the Upper Godavery Works for the half-year ending 30th April 1866, together with a copy of Executive Engineer's No. 517, dated 8th ultimo, in explanation of the discrepancies pointed out.

2. The Chief Commissioner will impress upon Major Haig, who has now joined, to be very particular in the preparation of future reports.

SECTION OF CANAL
FROM
DUMACUDIEM TO CONGOLE.



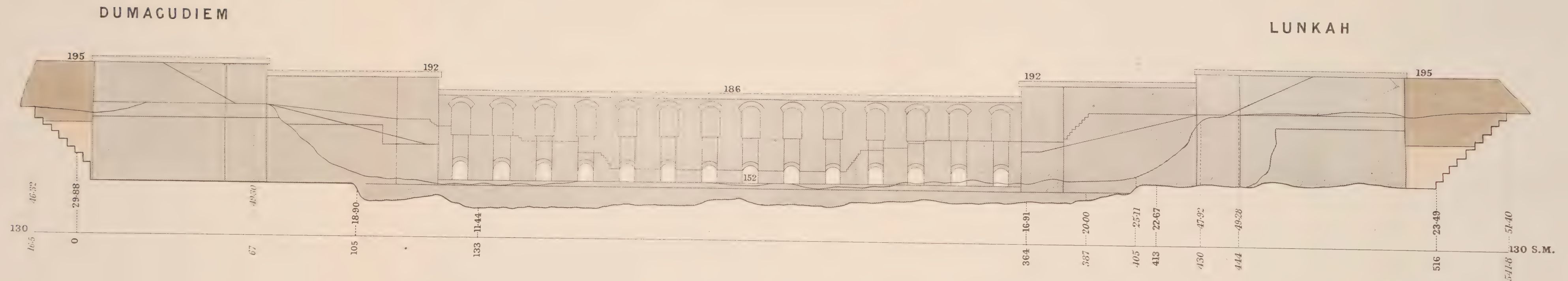
SCALES.



Reference.

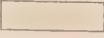
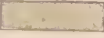
- Excavation previous to 1st May, 1865, Cut for a bottom width of Canal of 3 yards.
- D^o. from 1st May, 1865 to 31st October, 1865, Cut for a bottom width of Canal 8 yards.
- D^o. 1st November, 1865 to 30th April, 1866, D^o. D^o.
- Rock.

SCOURING SLUICES AT DUMAGUDIEM, U.G.W.



Reference.

From	To	Rock Excavation.	Earth Excavation.	Rammed Earth.	Earth in Embankment.	Rubble Masonry.	Cut Stone.	Pitching Slopes.
1 st May, 1863.	31 st Oct ^r , 1865.	38456	218928	222691	140677	173230	10048	"
1 st Nov ^r , 1865.	30 th April, 1866.	"	"	"	"	553	696	21237
1 st May, 1863.	30 th April, 1866.	38456	218928	222691	140677	173783	10744	21237

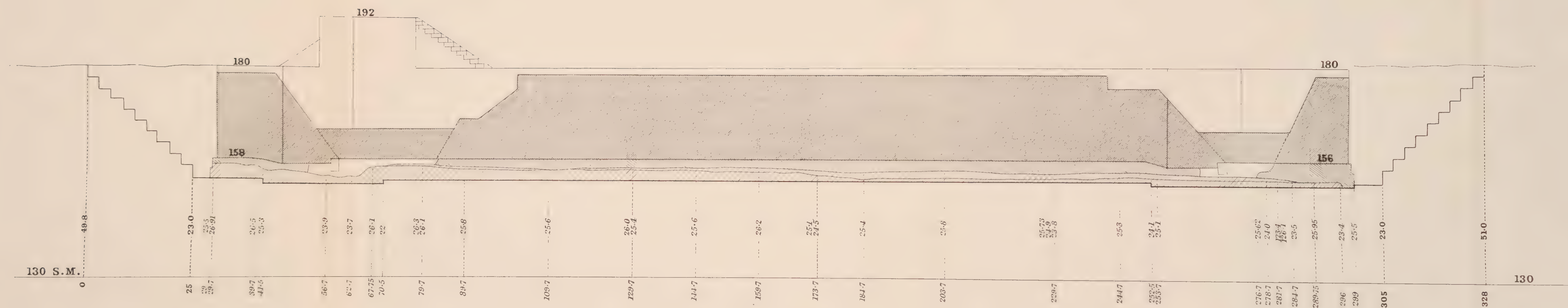
-  Masonry Completed previous to 31st October, 1865.
-  D^o..... D^o..... from 1st November, 1865, to 30th April, 1866.
-  Earthwork Completed previous to 1st May, 1865.
-  D^o..... D^o..... from 1st May, 1865, to 31st October, 1866.

Scale 30 Feet to 1 Inch.

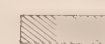
*A. H. D. Roberts. Lieut. R. E.
Eng. Engineer, U.G.W.*

HEAD LOCK.

Scale 20 Feet to an Inch.



Reference.

-  Section showing Rubble Masonry in Foundation Completed up to 31st Oct^r, 1865.
-  Section showing D^o D^o Completed from 1st Nov^r, 1865 to 30th April, 1866.
-  Elevation of Side Walls D^o D^o D^o D^o

*J. H. D. Roberts. Lieut. R. E.
Eng. Engineer, W. G.*

LONGITUDINAL

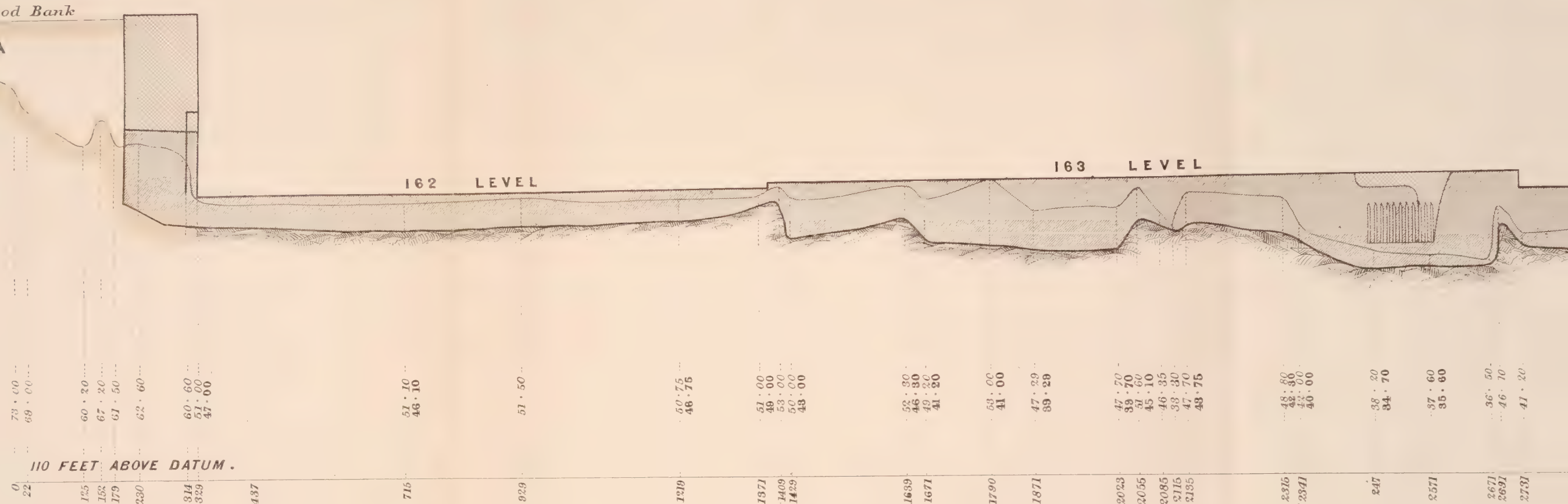
OF T

DUMUCUDIEN



Top of Flood Bank

LUNKA



110 FEET ABOVE DATUM.

Reference.



Masonry Completed previous to 1st May 1865.

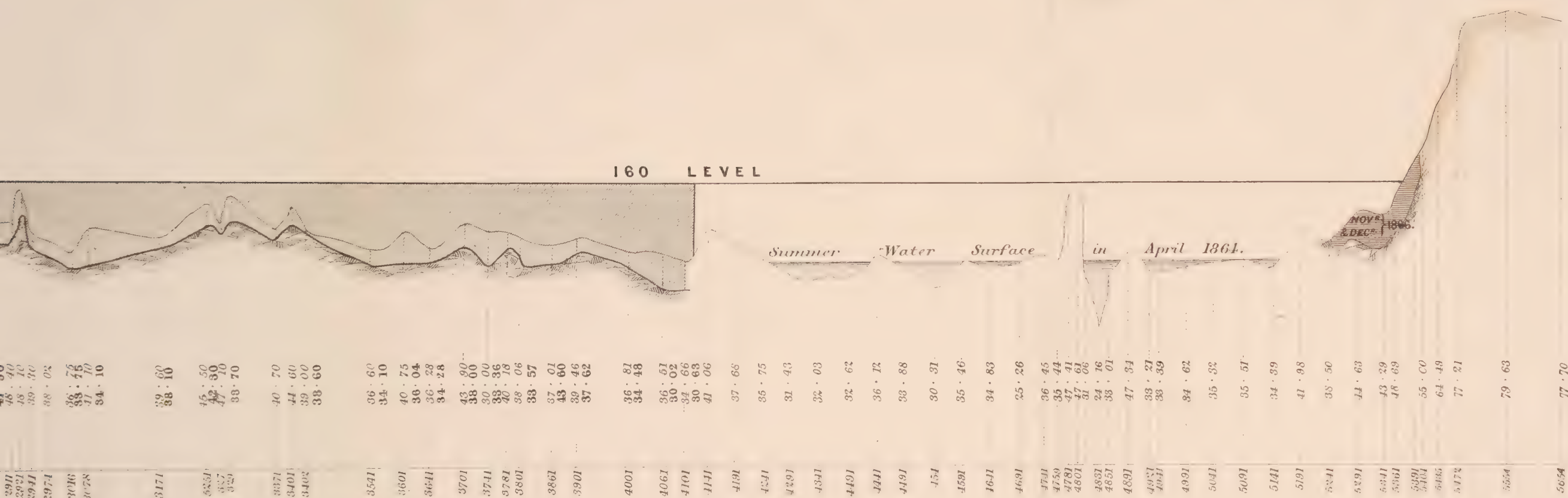
D^o.....D^o..... during year ending 30th April 1866.

Excavation in Rock Completed during Half Year Ending 30th April 1866.

SECTION

ANNICUT.

RIGHT BANK.



SCALES.

Horizontal 200 Feet to One Inch.

Vertical 20 Feet to One Inch.

J. H. D. Roberts, Lieut. R. E.
Exc. Engineer, U. G. W.

REMARKS.

NAME OF WORK.	QUANTITIES.		COST.			Per-Centage of Cost of Work done.		Rates per Hundred Cubic Feet.		or Savings on, Estimated Rates per Cent.	
	As in Estimate.	Done during half-year.	Total done to 30th April 1866.	During half-year.	From 30th April 1863 up to 30th April 1866.	As in Estimate.	Actual of work done during half-year.	Actual to 30th April 1866.	During half-year.	Up to 30th April 1866.	
1. Ancient—Masonry	782,675	6,017	385,603	77	48-72	Rs. 2,20,914	Rs. 5,012	Rs. 1,41,917	+ 105-14	+ 87-49	An error in totalling quantity in Monthly Returns was made in former Return, and is now corrected. Total Cost 1,41,917 rupees. This is obtained by careful examination and adjustment of Progress Reports previous to 31st October 1865, and may be explained as follows: Progress Reports from 1st May 1863, show labour and approximate value of stock of materials for the purpose of a full estimate of the work. The values given for stock were far from the actual values in many cases. When the actual values were received, the Progress Reports were made up accordingly, and the values for stock given by sub-divisional officers, were altered in this office. It now appears on the Register of Stock being made up to 30th April 1866, that the controller's rates are excessive, and to adjust matters, the excess must be written back to stock from works; it also appears that, on this account, the values for stock, and consequently the cost of work entered by the sub-divisional officers, are more likely to be correct than the cost as adjusted in this office. The total cost, as per sub-divisional officer's returns is therefore given, though still further alteration will be required as soon as permission is obtained to debit and credit the works with the differences of value of stock issued to them.
2. Sluice wall—Masonry	200,185	1,249	184,527	62	92-17	71,430	3,823	80,505	306-48	43-02	The total cost of sluice wall has been taken from the sub-divisional officer's Progress Reports, and for the same reasons as are mentioned in the case of the Ancients.
3. Head-lock—Masonry	256,902	148,587	208,967	57-62	81-32	88,457	53,862	80,080	38-25	38-32	The total cost of head-lock has been altered according to sub-divisional officer's return for the same reasons above-mentioned.
4. 1st Section of Canal—Earth-work	39,806,171 earth-work 503,325 rock excavation.	4,803,550	8,187,775	-	-	-	33,325	75,057	Per 1,000, 7-97	Per 1,000, 9-16	The difference between quantities of work estimated for in corrected and former Returns is owing to the fact that, in all Progress Reports hitherto sent from the Divisional Office, the estimated amount of earth-work only was entered without including rock excavation. The difference in total progress and cost is thus accounted for. The cost up to October 1865, has been treated in the manner described above, and the whole of the flood bank and its cost, which has been hitherto included under head of canal, has been separated from the cost of these portions of the original 1st section of the canal, and is now entered as a separate item under the head of flood bank. The quantities are stated as exclusive from the quantities of the original canal, and are omitted. The estimated cost and quantities should have been omitted in original Return, as those for the small canal had not been taken out on 30th April. They will appear in next half-yearly Report. The whole of the work carried out during the half-year has been on the small canal.
5. Flood bank	-	805,808	3,112,508	-	-	-	9,460	23,866	Per 1,000, 11-74	Per 1,000, 7-67	The cost of flood embankment, which shows a very high rate for the half-year's progress, includes cost of three single and one double-vented masonry culvert running under the flood bank.
6. Protective works at Lungh	173,800	64,252	64,282	36-66	36-66	23,672	6,362	6,362	Per 100, 9-89	Per 100, 9-36	
7. Accommodation for Establishment	-	-	-	-	-	50,000	8,108	30,940	-	-	
8. Tools and Plant, &c.	-	-	-	-	-	-	6,832	-	-	-	
9. Manufacture of Stock	-	-	-	-	-	-	2,607	-	-	-	
10. Repairs of Tramway	-	-	-	-	-	-	4,933	-	-	-	

ABSTRACT of first five Items in the foregoing Tabular Statement.

Masonry	1,939,822	155,853	759,187	12-56	61-23	3,80,801	62,702	3,02,502	16-46	70-43	30-71	40-23	30-84	8-100	29-73
Earth-work	80,809,866	5,610,858	11,300,883	-	-	-	47,785	98,923	-	-	-	8-51	8-75	-	-

W. M. Roberts, Lieut., R.E.,
Exec. Engr., Upper Godavery Works.

(No. 517, dated 8 October 1866.)

From Lieutenant *W. M. Roberts*, R. E., Executive Engineer, Upper Godavery Works,
to Superintending Engineer, Nagpore Circle.

I HAVE the honour to return the papers received with your No. 206-2548 of the 14th September 1866, together with a revised report, with explanation attached.

2. As the report is only an approximate one, and I found on reference to previous reports that it appeared customary, especially in the half-yearly reports, to introduce corrections on previous totals, I did not consider it necessary to report the changes made, of which explanations are given on the margin of the report.

3. All alterations in cast have been made in total cost up to 31st October 1865.

4. I have, however, been unable to account for the quantity of work and expenditure on 1st section of Canal shown in the Progress Report of this Division, for the half-year ending 31st October 1865. The progress for half-year shown is 4,420,964 cubic feet, whereas the Sub-Divisional Report shows an aggregate amount of 2,375,372 cubic feet for both canal and flood bank, the cost being increased in like manner. No explanation of this is appended to the office copy of Progress Report; but as this, as well as the Monthly Progress Reports passed through the Superintending Engineer's Office, I presume that the discrepancy is on account of progress missed out in previous reports. I have been unable as yet to reconcile this discrepancy, but am now abstracting the quantities and cost of work from the commencement (May 1863) from the day-books and Controller's abstracts (formerly issued).

This does not, however, affect the quantity of work finished on the small canal to Gongole.

— No. 17.—

(No. 36, Public Works—Government of India—Public Works Department.)

To the Right Honourable the Secretary of State for India.

Sir,

Fort William, 8 March 1867.

Civil Works
Communications.

WE have now the honour to submit the Report of Colonels Fife and Anderson, the Commissioners on the Godavery Navigation Project, with Memoranda by Major Haig thereon, and Minutes by Mr. Temple, Chief Commissioner of the Central Provinces. We have given these documents careful consideration, and, in submitting them, beg to reply to Sir Charles Wood's Despatch, No. 11, dated 8th February 1866, on the same subject.

2. It will be seen that the Commissioners are in favour of continuing the works, but in view to boat rather than to steamer traffic they recommend the reduction of the size of the locks, and the construction of a short canal only at the 1st Barrier, and certain modifications of the design for the works at the 2nd Barrier. They further recommend the completion of the survey for the 3rd Barrier, and also the construction of the road from Chanda to Seroncha, not as superseding the 3rd Barrier works, but as tending to open the communication sooner, and as being likely to be useful as a feeder after the navigation works are completed. Colonel Fife also recommends the prosecution of surveys and preparation of projects for storage of water.

3. Mr. Temple differs with the Commissioners in preferring the long canal to the short one at the 1st Barrier, and in adhering to the adaptation of the project to steam navigation, and therefore preferring the large locks. He reads the Commissioners' report as opposed to the construction of a road, and urges strongly the necessity for constructing a cheap road from Chanda to the foot of the 3rd Barrier, while the construction of the works of navigation at that Barrier must necessarily be expensive, and may be so much so as to prohibit the execution of the works of navigation at all. At the same time he recommends the complete investigation of the entire scheme in its fullest development, and adds a Minute on the probable advantage and facilities of carrying the navigation up the Wynegunga to the Cantonment of Kamptee, near Nagpore.

4. We concur with Mr. Temple in thinking that the adaptation of the project to steam navigation should not be given up, and that, therefore, steamer locks should

should be provided. We also concur in regard to accepting Major Haig's project for the 2nd Barrier; but we agree with the Commissioners in preferring, for the present, the short canal at the 1st Barrier, to the longer one. This we do, not so much in the conviction that the latter is equally good as a permanent communication, as in the belief that it will suffice for the rapid opening out of the navigation, while the greater expenditure, and still immature project for the larger canal, might lead to delay. Mr. Temple appears not rightly to have apprehended the difference of cost between the long canal and short canal projects. The state of the case is as follows:—

	Cost in Lakhs.	
	Long Canal Project.	Short Canal Project.
Spent up to May 1863 - - - - -	4	4
Estimate to complete these - - - - -	30 $\frac{1}{4}$	13
TOTAL - - - - -	34 $\frac{1}{4}$	17
Deduct, spent before May 1863 - - - - -	4	4
„ „ since - ditto - - - - -	7 $\frac{1}{4}$	4 $\frac{3}{4}$
TOTAL spent - - - - -	11 $\frac{1}{4}$	8 $\frac{3}{4}$
Balance to be spent - - - - -	23	8 $\frac{1}{4}$

making nearly 15 lakhs in favour of the short canal.

5. We submit a copy of the letter from our Secretary, conveying orders to the Chief Commissioner to cause the works at the 1st and 2nd Barriers to be carried out according to these views.

6. It will be seen that we have reserved the further extension of the project for your orders; but we have ordered projects to be prepared both for the navigation works to Hingunghât, and for the road from Seroncha, and the foot of the 3rd Barrier to Chanda.

7. We are still of opinion that the road is necessary. The case is strongly put by Mr. Temple. The decision in favour of a road has been three times affirmed by the Governor General in Council (*see* Resolution forwarded with our Despatch No. 90, of 9th August 1865), and was accepted in Sir C. Wood's Despatch No. 18, of 25th April 1864. We think it is necessary to have, at least, a cheap road constructed at once either to Seroncha or to the foot of the 3rd Barrier, and we request your permission to order this accordingly.

8. With reference to the doubts expressed as to a road of such length being useful for purposes of trade, we would refer to the Grand Trunk Road from Mirzapoor to Calcutta, 450 miles, which for years carried a large traffic of cotton and piece goods in competition with the Ganges, and still carries a great deal in competition with both the Ganges and the railway, at least while the latter is unable to carry all that is presented to it. This case is not exactly analogous to that of the Godavery, but there is enough of similarity to prove that the road project is not likely to result in a useless expenditure, if the navigation works are to develop any traffic. We think, therefore, that the road, which can certainly be carried out at a moderate expense, and within a moderate time, should be allowed to be carried out at once, whether the navigation works at the 3rd Barrier are to be executed or not.

9. It will be seen, however, that we have ordered the prosecution of the surveys and preparation of detailed estimates for the latter.

10. We do not recommend any further surveys or works at present, preferring to await the estimates on the 3rd Barrier before taking any steps towards further expenditure. We, however, beg to draw attention to Mr. Temple's Minute on the navigation of the Wynegunga.

11. While we have ordered the arrangements above reported to be carried out, as being on the whole the most desirable course to pursue after the steps

which have already been taken towards the execution of the works embraced in the Godavery Navigation Project, we are still not convinced that what has been done and ordered will, on the whole, prove to be profitable in any degree commensurate with the expense. We forward a Minute by our colleague, Sir Henry Durand, which tends to support this view.

We have, &c.
(signed)

John Lawrence.
W. R. Mansfield.
H. S. Maine.
W. Grey.
G. N. Taylor.
W. N. Massey.
H. M. Durand.

Enclosure 1, in No. 17.

(No. 267-3079, dated 19 October 1866).

From Colonel *W. Maxwell*, R. A., Secretary to Chief Commissioner of Central Provinces, in the Public Works Department, to Secretary to Government of India, Public Works Department.

Government of
India, No. 1221 C
of 4th December
1865, to Chief Com-
missioner of Central
Provinces.
Secretary to Chief
Commissioner,
No. 50-1467 of 17th
July 1866, to Secre-
tary to Government,
Public Works De-
partment.

In reference to the correspondence marginally noted, regarding the mission of Colonels Anderson and Fife to the Godavery, I am directed to forward a printed copy of the Report made by those officers, and of the Chief Commissioner's Minute thereon. In that Minute reference is made to the contemplated submission separately of the Chief Commissioner's views regarding the navigability of the Wynegunga. I am accordingly to transmit, with this Despatch, a printed copy of a Minute by the Chief Commissioner on that subject also. As these two Minutes comprise all that Mr. Temple has at present to represent on the whole subject, it seems superfluous to touch further thereon in this letter.

2. It being understood that the Government of India desired to receive these papers at an early date, all practicable expedition has been used in their submission. The Report by Colonels Anderson and Fife was received in manuscript, and had to be printed here.

Enclosure 2, in No. 17.

REPORT on the UPPER GODAVERY WORKS, by Lieutenant Colonel *J. C. Anderson*, and Lieutenant Colonel *J. G. Fife*, Royal Engineers.

Colonel *W. Maxwell*, R. A., Secretary to Chief Commissioner, Public Works Department, Central Provinces.

Sir,

WE have the honour to submit a Report on the Upper Godavery Works, which we examined in February and March last, in conformity with the orders of the Government of India, dated 14th December 1865.

2. Our examination of the upper part of the river was somewhat more cursory than we could have wished, and we had no time to explore its important branches, the Wurda and Wyne Gunga, in consequence of our receiving orders, when at the 1st Barrier, to proceed to Cawnpore to attend a committee on the Ganges Canal, which was to meet towards the close of March, and to postpone the preparation of our Report on the Godavery.

3. Our duty on the Ganges Canal was not completed till nearly the end of June; but during the period for which we were necessarily detained before the report of the committee could be fair copied and printed, we found time to revert to the subject of the Godavery, and to draft our report from the notes which we had made on the spot upon it by the date which the committee obtained permission from the Government to disperse.

4. We beg to express our thanks for the assistance we received from the Chief Commissioner and yourself, on our journey through the Central Provinces, and to the officers employed on the Upper Godavery Works, especially to the executive engineer, Mr. Isaac, and to Mr. DeGronsilliers, who has charge of the transport department, and who rendered us much valuable assistance.

To

To Major Stoddard our special thanks are due; he accompanied us during the whole of our journey, and spared no pains to furnish us with all the information that we could desire regarding the history of the Godavery Works.

We have, &c.
(signed) *J. C. Anderson*, Lieut. Colonel,
Royal Engineers.

Roorkee, 27 June 1866.

J. G. Fife, Lieut. Colonel,
Royal Engineers.

REPORT.

SUMMARY OF CONCLUSIONS.

WE beg to preface our Report by a summary of the conclusions we have arrived at, in the form of replies to the questions which were put to us in the letter from the Government of India to the Chief Commissioner, Central Provinces, dated 14th December 1865, and which indicate the nature of the information which the Government wished us to furnish, on the subject of the works in the Upper Godavery.

These conclusions are to the following effect:—

I. Rejecting the portion of the longer line of canal at the 1st Barrier, we consider that the works executed for the minor project are sound and good, and likely to stand with but trifling additions to the designs as approved by the Government of India.

II. That the greatest zeal has been displayed by the officers employed under Major Haig, and his own exertions have been remarkable, but the past management of the works has not been successful or economical.

III. That the works of the general character of those now in progress and designed will effect the object in view of affording the means of carrying on navigation by steamers for four or five months of the year, and by boats, with occasional interruption during high freshes, for eight or nine months of the year; but that a portion of that period will be suitable for boats of very light draught only.

IV. As regards the works at the 1st Barrier, looking at the requirements of a navigation for four or five months only, that the anicut might have been dispensed with, but that in order to allow of boat traffic being carried on for a period of several months longer, its construction was necessary. As regards the 2nd Barrier, that an anicut near the head of the barrier and a canal from it to the open portion of the river below, would have been the most perfect mode of procedure, but that its cost would be greater than that of the works designed by Major Haig, and that the latter will answer the purpose intended, with some modification as regards details of construction, and that the cost of the works is not likely to be less than the amount of the estimate.

V. That before the communication can be pronounced efficient, the line of navigation should be continued as far as Chanda on the Wurda, and that one of us (Colonel Fife), would advocate a further examination of the river and its tributaries in connection with storage works, with a view to increase the natural supply during the dry season.

VI. Excluding the portion of the estimate which relates to the construction of a road from Sironcha to Chanda, that the expenditure contemplated is approximately sufficient for the scheme, as at present defined by the Government.

VII. That we cannot give any figures to show whether the advantages obtained from the proposed communications will be commensurate with the outlay; but we are of opinion that Government will not reap any considerable direct return from the expenditure, but that the general improvement of the country, and the increase of trade, which will be induced by the opening of the communication, will be sufficient to justify the outlay; further, that the works in the Godavery itself having once been completed, any extension of the line of the navigation which, on inquiry, may be found practicable, would serve to enhance the value of those works.

VIII. That the construction of the works at the 2nd Barrier should be carried out simultaneously with those at the 1st Barrier, and with the removal of rocks in the more open portions of the river.

IX. That the establishment and stock of steamers should be maintained in the lowest possible scale consistent with the supply of food to the workmen, and the transport of material for the completion of the works at the 1st Barrier, and that supplies for the workmen at the 2nd Barrier should be obtained through the aid of the civil authorities at Sironcha;

further, that private stores should be carried only so far as can be done with the minimum establishment and stock as above recommended.

(signed) *J. C. Anderson*, Lieut. Colonel,
Royal Engineers.
J. G. Fife, Lieut. Colonel,
Royal Engineers.

SECTION I.

PRELIMINARY OBSERVATIONS.

Description of route.

1. WE left Coconada on the 1st February 1866, and arrived at Chanda on the 10th March. Of the total distance, 385 miles, we accomplished 125 miles in a small steamer drawing two feet of water, 190 miles more in a boat drawing 15 inches, and the remainder by land; we were occupied for a fortnight in examining the works at Doomagoodium or at the 1st Barrier, and the sites of those proposed near Enchampilly for surmounting the 2nd Barrier. Further particulars relating to our journey will be found in Appendix (A.)

Character of Godavery previously described by Major Haig and Chief Commissioner, Central Provinces.

2. The general features of the Godavery and of its principal branches have been so fully described in Major Haig's reports, particularly in those written after his exploring expedition of 1856, which were published by the Madras Government, as well as in the comprehensive report of the Chief Commissioner, Central Provinces, in 1863, that we are relieved from the necessity of entering into any topographical details.

Leading features noted.

3. We need only mention a few of the leading features. Doulaishwaram, at the head of the Delta, is connected with the sea at Coconada by a canal 30 miles in length, navigable itself or alternately with two branches terminating at the same point, throughout the year. Doomagoodium, the head-quarters of the works designed for the 1st Barrier, is about 115 miles above Doulaishwaram; Enchampilly, at the foot of the 2nd Barrier, is 195 miles; and Mogellee, a small village at the foot of 3rd Barrier, is 285 miles above the same place.

4. The distance from Mogellee to the head of the 3rd Barrier, near Salagaon, on the River Wurda, is 30 miles; and from the latter to Chanda 40 miles by land and 55 miles along the Wurda, which approaches to within four miles of it. Chanda is thus 355 miles from Doulaishwaram by one route and 370 miles by the other, or from Coconada 385 miles and 400 miles respectively.

Project as recommended by Chief Commissioner;

5. The Chief Commissioner has recommended that the project for the improvement of the Godavery should be confined for the present to the opening out of the 1st and 2nd Barriers, so as to carry the navigation up to the foot of the 3rd Barrier, and to the construction of a road from that point to Chanda, in order to complete the connection of the navigation with the road system of the Central Provinces.

And approved by Government of India.

6. The Government have accepted these views, and are prepared to sanction estimates amounting to 52 lakhs of rupees, or including past expenditure about 80 lakhs in all, should they feel satisfied after full inquiry that the works which have been proposed for surmounting the difficulties of navigation will really answer the purpose for which they are intended. Comparing the whole communication from Chanda to the sea to a road which will be open for a considerable part of the year, they are prepared to sanction the same outlay as would be required to construct a road for the whole distance.

Original design of Major Haig.

7. Major Haig's project was not limited to opening out the river for navigation as far as the foot of the 3rd Barrier. He intended to pass round it by a canal, and thus to gain access to the Wurda, and by certain improvements to that river to obtain an unbroken water communication with Hingunghat, 75 miles above Chanda. Nor was his scheme to terminate here. He looked ultimately to the foundation of storage reservoirs in the upper sections of the Wurda and other confluent of the Godavery, to let out the water from them to increase the scanty summer supply of the river, and partly by such aid, and partly by means of canals, dams, and other works, to form a perennial water transit from various parts of the Nagpore Provinces to the sea.

Major Haig's project curtailed in consequence of expense being greater than he anticipated.

8. The great cost of the works which have been in progress in the lower portions of the river—very much greater than Major Haig had counted on—has engendered distrust both in the minds of the Government and of a large section of the public, as to the feasibility of the scheme, excepting at a cost altogether disproportionate to the objects to be gained; and it has been decided that, for the present, Major Haig's project should be cut down to the lowest limit compatible with anything which could be called the opening out of the Godavery. The Chief Commissioner, though he acknowledges the importance of connecting it with the Wurda, and is quite prepared to recommend any project by which this could be satisfactorily accomplished at a reasonable cost, declines to commit himself to it, until the expense

expense and feasibility shall have been fully investigated; and we think, after the manner in which estimates have been exceeded on the works in progress, he could hardly do otherwise. In the meantime he recommends the construction of a road, which, in any case, is necessary to complete the communication between Nagpore and Sironcha, the head-quarters of the Upper Godavery district, and which, in his opinion, will help to feed and develop the navigation of the river.

9. The approximate estimate of expenditure given in the 9th para. of the order of the Government of India on the Upper Godavery works, provides for the construction in all of 125 miles of road, which may be divided into three sections, viz.:

From Chanda to head of 3rd Barrier	-	-	-	40 miles.
„ head to foot of 3rd Barrier	-	-	-	30 „
„ foot of Barrier to Sironcha	-	-	-	55 „

Proposed road from Sironcha to Chanda. No. 81—No. 930—3c, dated 13th September 1865.

Captain Glasfurd, Deputy Commissioner of Sironcha, in a memorandum which he has lately written on the subject, dated 26th March 1866, has pointed out that the construction of a road from the foot of the 3rd Barrier to Sironcha along the bank of the river could not be carried out except at great expense, as it would have to cross the numerous drainages where they enter the river in deeply cut ravines, and he recommends in preference a line of road further inland along the route* now generally followed, and on which there is already a considerable traffic.

* *Vid* Kotapully, Bibbree, Seerpoor, and Dhaba. Comparison of routes.

10. Captain Glasfurd enters into the subject very fully, and the arguments he brings forward in favour of the latter route leave no room for doubt of its superiority to the other. We would add that Mogellie at the foot of the 3rd Barrier is a wretched hamlet in the middle of the jungle; that it is very unlikely that merchants will establish themselves there, and that in consequence goods would be consigned and probably sent by land the whole way from Chanda to Sironcha, if a good direct road were available, in preference to being sent partly by land and partly by water by the barrier route. In that case Sironcha would constitute the terminus of the river navigation for through-traffic to and from Chanda, and the route to it from the sea coast would be divided into the following sections:—

Coconada to Doulaishwaram, canal	-	-	-	30 miles.
Doulaishwaram to Sironcha, river	-	-	-	230 „
Sironcha to Chanda, road	-	-	-	100 „
				360

11. Although the completion of the project to the above limit would probably be sufficient to justify the outlay contemplated, and although it would doubtless have the effect of expediting the improvement of the country bordering on the Godavery, and of inducing a considerable trade to and from the coast as far as Chanda, still we are of opinion that the influence would not extend much, if at all, beyond that limit. Chanda is only on the borders of the cultivated portion of the Nagpore Provinces, and on the opposite side the railway approaches to within 70 miles of it. As the distance of any point beyond Chanda from Sironcha is increased, the distance from the railway is diminished, and the traffic towards the Godavery would evidently be carried on with great disadvantages.

A road from Sironcha to Chanda not likely to induce a large traffic.

12. While, then, we consider that the opening of the Godavery to Sironcha is of itself a desirable measure, and that the construction of a road from Sironcha to Chanda would serve as a feeder to the river, we are of opinion that its influence would not extend to the best part of the Nagpore Provinces, and that the object for which the Godavery works were originally sanctioned would remain unaccomplished,—we would therefore venture to recommend that the road from Sironcha to Chanda should be treated as a separate work, and that the formation of a line of water communication from Sironcha to Chanda should not be definitively abandoned until it can be ascertained for certain whether or not it is really practicable at a reasonable cost.

Original project for a canal round 3rd Barrier should be reconsidered.

13. We labour under the same disadvantage as Mr. Temple, in having no data on which to base a correct estimate of the probable cost of a canal round the 3rd Barrier to connect the Godavery and Wurda, and of the improvement which would be necessary on the latter river to render it navigable to Chanda or Hingunghat. Inspection by simply riding over the ground is liable to mislead, and we shall not attempt to estimate the cost of a canal; we can only say that the ground is much more favourable for the formation of a canal than that at the 1st Barrier, and that there are no large drainages to be crossed. A line of levels has been taken along the route by which it was intended to carry a road round the barrier. The section along the line displays great inequalities on the surface of the ground, but as the country slopes towards the river the higher ground might be avoided by moving further towards the river, and the lower, by moving further from it. The 12 locks which would be required would probably be the principal expense.

No data as to cost of a canal, but ground supposed to be favourable.

14. The Wurda is a very much smaller river than the Godavery, its width being only about 1,200 feet at the head of the 3rd Barrier, and considerably less towards Chanda. It has a compact well-defined channel and firm abrupt banks. In many places rock appears both in the bed and banks. The head of the 3rd Barrier extends across the Wurda several miles above its junction with the Wyne Gunga. The rock would furnish a secure foundation

The Wurda a more manageable river than the Godavery.

tion for a weir, and the small quantity of water in the river during the dry season would further simplify the construction of the work.

Slope of bed to Chanda moderate.

15. The bed or rather the low-water surface of the river is on a dead level for upwards of 20 miles above the barrier; and the total rise from the barrier to a village opposite to, and four miles from Chanda, and 50 miles from the barrier, is 30 feet.

16. Two weirs, one at the barrier and a second at some intermediate point, would therefore suffice to pond-up the water for still navigation.

Wurda suitable for still-water navigation.

17. The Wurda in its natural state is navigable for only three months in the year, and only then with periods of interruption; but there is a sufficient supply for still-water navigation throughout the year. Boats from Hingunghat and other places in the upper part of the Wurda could come to Chanda during periods of high freshes; but from Chanda to the head of the barrier, and from thence by a still-water canal 30 miles in length, they would have access to the Godavery at all seasons.

Chanda a favourable terminus for line of navigation.

18. We have observed above that Mogellee, at the foot of the 3rd Barrier, is an unfavourable point for terminating the river navigation, and that in consequence of the difficulty which would be experienced in inducing merchants to establish themselves in such an ill-favoured spot, goods would probably be consigned to merchants in Sironcha, and sent by land the whole way. Between 50 and 60 miles of water communication (between Mogellee and Sironcha) would thus be lost; there would therefore be a great advantage in this respect, in selecting Chanda as the terminus of the navigation. It is a large and important town in a well populated and fairly-cultivated country; roads will connect it with Hingunghat and other places in the interior, and it would thus be a convenient emporium for traffic to and from the coast.

A water communication of the Wurda would give a fair test of the value of the Godavery.

19. If the arrangements we have recommended are found worthy of execution, the merits of the Godavery route would then be put to a somewhat fairer test, and the Government would be able to obtain a better idea of the nature and extent of traffic the Godavery will carry, before further improving its navigation.

20. Should these views be accepted, the river will be rendered navigable for steamers for five months in the year (June to December), the exact period, of course, depending on the draught of the vessels which may be used; and for boats drawing 18 inches—and subject to some delay perhaps up to two feet—to the end of February. From the Godavery to Chanda, and *vice versâ*, boats could ply throughout the year. The total length of the line of navigation would be 400 miles, divided as follows:—

	Miles.
Coconada to Doulaishwaram	30
Doulaishwaram to foot of 3rd Barrier	285
Canal round Barrier	30
Wurda to Chanda	55
	400

Further examination of the Wurda and Wyne Gunga recommended.

21. It is quite possible that a careful examination of the Wurda above Chanda, and of the Wyne Gunga, may lead to the conclusion that they might be adapted for still-water navigation at a moderate outlay, and such schemes may be well worthy of consideration even if intended to facilitate local traffic only. One of us (Colonel Fife) considers that the development of the navigation beyond the limit above specified may with advantage be taken into consideration at the present time, and he has accordingly drawn out a memorandum expressing his views on the subject, which will be found in the Appendix.

SECTION II.

PROBABLE TRAFFIC ON THE GODAVERY.—I. BY STEAMER.

Style of vessels suitable for the Godavery must be ascertained before an opinion can be formed of the efficiency of proposed works.

22. It may seem premature at this stage of our report to enter upon a consideration of the question, as to how the navigation of the Godavery is to be carried on after the obstacles at the barriers shall have been surmounted; but, in fact, an attempt must be made to ascertain what style of vessels is best adapted for the peculiar circumstances of the river before we can express an opinion of the efficiency of the proposed works.

Locks ordered to be 30 feet, to allow of steamers being passed round the barriers.

*Telegram from Secretary to Government of India, No. 44, dated 20th March 1865.

† Parliamentary Blue Book, Upper Godavery, p. 71, para. 8; p. 81, para. 61.

23. The Government have decided in having locks, where such works are to be built, 200 feet long and 30 feet wide* in the clear. Major Haig originally proposed locks 45 feet wide;† but at the suggestion of his Excellency, the late Governor of Madras, he reduced the width to 30 feet; and the question then arose, can steamers, suitable for the navigation of the river, be found, which can be passed through a lock of this size, or must there be separate steamers to work between the barriers? In the latter case the width of locks would be unnecessarily great, for no cargo boats are likely to be required of greater beam than 18 or 20 feet; and as a large proportion of

of the boats which will be used on the river will be small native craft, there could be no necessity, so far as boats only are concerned, of allowing a greater width than 20 feet.

24. The locks on the canal from Doulaishwaram to Coconada are 100 feet long by 15 feet wide, excepting one which is 50 feet longer; but most of them are in bad repair, and will have, ere long, to be reconstructed. They could then be made to suit the dimensions of whatever craft is found best adapted for the river, but in the event of its not being considered necessary to use steam on the canal, and owing to the high price of fuel in the Delta, we think it will have to be dispensed with; the locks would probably not have a greater capacity than 150 feet, or 200 feet by 20 feet.

Locks on Delta
Canal 15 feet wide.

25. Major Haig, in order to avoid the necessity of having separate steamers in the reaches between the barriers, and to obtain at the same time vessels with sufficient beam for the application of powerful engines, has proposed the introduction of stern-paddle wheels. He had seen a number of stern-wheelers in America, and had heard them well spoken of: all that Major Haig writes is worthy of the highest attention; but we must own, notwithstanding the testimony he bears in favour of these vessels, that we entertain misgivings of their success. They are applied on certain rivers in America, but there must surely be some points in which they are inferior to the side-paddle steamers, or why is it that the latter are so generally used in the larger class of rivers and in lakes? We believe that the side-paddles, which must act as out-riggers, are a source of security to flat-bottomed vessels in a strong current, or in a whirlpool, such as is occasionally encountered on the Godavery during the freshes, and that the stern wheels would not be so well under command, and more liable to injury, should the steamer be accidentally swept round against a rocky bank. Mechanical engineers in England can have little knowledge of the nature of the currents in a river like the Godavery, and any vessel on a new pattern which they may build specially for its navigation, must be regarded as an experiment. So many similar experiments have ended in no useful result, that we are more sanguine of obtaining a good pattern for a steamer, by a modification of those which have been found after many years experience to answer best for the rivers of Upper India than by ordering an entirely new one; as the matter stands, the Government have approved of 30-foot locks, on the understanding that suitable steamers will be found which can be passed through them. We have doubts, as above explained, of stern-wheel steamers answering, while side-paddle steamers of 30 feet beam in all, would not have sufficient power. We must therefore express our opinion, that until this important question, the width of lock best adapted for steamers, is decided, the Government may be committing themselves to an expenditure which may prove to be ill-judged. The locks may prove too small for the proper class of steamers, while they would certainly be needlessly large for any cargo boats.

Stern-wheel steamers proposed by Major Haig. Doubts as to their efficiency

26. The difficulty would be removed if Government reconcile themselves to what Major Haig considers a serious disadvantage—the employment of separate steamers between the barriers. Had the estimates for the works been approximately accurate, the difference in expense between a lock 200 by 30, and one 150 by 20, might not have been a serious consideration; but it appears, as we shall have to show further on, that even the latest revised estimates will be largely exceeded, and as, moreover, the delay in completing a large work as compared with a smaller one, causes a multiplication of the expenditure, by the establishment which must be kept up, and by the contingent charges which must be incurred for a longer period, we consider that the question of boat locks only and steamers between the barriers, may be re-opened with advantage.

Twenty-foot locks recommended and steamers between the barriers.

27. The distance from Doulaishwaram to the proposed terminus of the canal at the first barrier is 112 miles; from the head of the first barrier to the second, 80 miles; and from the second to the third barrier, 90 miles. The lengths of the second and third reaches do not differ to any material extent, and the excess in that of the first represents, at most, a day's steaming up stream, so that there would be no great disparity in the duty to be done, supposing one or more steamers were stationed permanently in each section. They could be taken over the anicuts on the tops of the freshes, if required to be changed. There would doubtless be some extra expense if this plan were adopted, as either a spare steamer would be required in each reach to be ready to replace one that might be disabled, or at such times as the anicut should not be passable, the paddles would have to be unshipped to admit of its being passed through the locks.

No serious inconvenience likely to arise from having separate steamers between the barriers.

28. Should a canal round the third barrier to connect the Godavery with the Wurdā be sanctioned, it would at all events be unnecessary to have the locks on it more than 150 feet long by 20 feet wide. It would be still water navigation, and there would be about 12 locks in a distance of 35 miles. Little or no time would be saved by having steamers, as they and the boats towed by them would have to be locked through separately, so that the time gained in steaming would be lost in the lockage.

Twenty-foot locks sufficient for a canal round third barrier.

29. We are the more urgent in deprecating expenditure on locks of 30 feet in width before their fitness for steamers is placed beyond all doubt, and in recommending for the consideration of Government the alternative of having boat locks only, because we are of opinion that it is highly improbable that steamer traffic will pay on the Godavery. We are aware that by making a calculation based on the cost of a steamer, and the duty it can perform, it can be shown that it would pay very well. But on a river where the traffic has to be created, and where the cost of working a flotilla must be matter of uncertainty, such

Steam traffic not likely to pay, and large locks less necessary on that account.

hypothetical calculations are entirely unreliable. The only test which can be accepted as at all valid is, the successful or unsuccessful result of steam navigation on other Indian rivers, allowance being made for any striking advantages or disadvantages for navigation which they may possess as compared with the Godavery.

Steam traffic on
Ganges and Indus.

30. The navigation by the Ganges is open for steamers from Calcutta to Allahabad throughout the year, and by the Indus and Chenab, from Kotree to Mooltan, a distance of 570 miles. The steamers draw three feet and upwards, they are liable to ground, and are occasionally detained for a considerable period. But this disadvantage is accepted in preference to reducing the draught. On the Ganges there is a command of unlimited traffic, and the Indus is the natural outlet for all the export trade of the Punjab. The termini of the lines of navigation, Allahabad and Mooltan, are most favourably situated for concentrating the traffic from the Upper Provinces. Yet steam navigation, though it has been long established, does not, as far as we can learn, pay well enough to enable it to compete with the railway on the Ganges, and on the Indus pays apparently barely 5 per cent. How can it be expected then that steamers can be worked profitably on the Godavery, when the navigation for steamers, with draught of three feet, will be open for only four or five months in the year, and when the only single advantage to counterbalance this drawback is the cheapness of fuel, and while there are serious disadvantages from the heavy floods and frequency of rocks? Nothing has been spent on improving the Indus: a considerable sum will have to be expended on the Godavery, even for six months' navigation; and the Government might reasonably impose tolls to reimburse them for the outlay. If they do so, the profits of the navigation would be still further reduced. Much of the traffic on the Indus pays a high rate for freight; about 3,000 tons of railway materials were carried up by the steam flotilla in the year 1865, at a rate of 20 pie per ton per mile, for the 570 miles from Kotree to Mooltan. A large quantity of malt liquor is also conveyed for the use of the troops in the Punjab, and troops are also conveyed by the same route.

Cotton not likely to
be sent by the God-
avery route.

31. On the Godavery the principal traffic would be in grain, salt, and other articles, which would have to be carried at low rates, if the steamers wish to compete with native boats. The cotton from Berar is likely to go by railway, and though a considerable quantity might find its way down the river from the valleys of the Wurda and Godavery, it is questionable whether it would be large enough to justify the use of steam. The circumstances of the Godavery have changed considerably since the project was first brought forward. The works were pushed on in the expectation that they would give the means of transporting the cotton crop of the Nagpore Provinces to the coast; but the object is now accomplished by the Great Indian Peninsular Railway, and the fact of merchants paying a high rate of freight to get the cotton of the North Western Provinces conveyed by railway from Allahabad and other places, in preference to sending it down the Ganges by steamers or native boats, shows that it is vain now to expect that the Godavery navigation will draw any of the cotton from Berar, especially as the terminus of the navigation will be at a considerable distance from the cotton field, while the railway passes right through it.

Primary object of
Godavery naviga-
tion, no longer in
existence.

32. It appears to us, then, since the primary object for which these works were put in operation, and which alone was of sufficient importance to justify their being carried out on a scale which should admit of the application of steam power, is no longer in existence, that the Government may well pause before they sanction any considerable expenditure on steamer locks; under present circumstances, we recommend the capacity of the locks at the barriers being limited to 150 + 20. If steam power is introduced, separate tugs would then have to be located between the barriers, and would ply along distances as above explained, of 112, 80, and 90 miles.

Traffic under Go-
vernment manage-
ment deprecated.

33. It is probable that the Government will not expect any direct return, unless, perhaps, a toll sufficient to cover the cost of maintenance, from the Upper Godavery works, but will be satisfied with the indirect benefits to which the traffic will give rise, in the shape of increased land revenue and of increased sale of salt, and with the improvement in the condition of the people, which would not fail to follow. We are of opinion, however, that the action of Government should cease with the completion of the works, and that the conveyance of goods should be left to private enterprise. If our surmise that steam traffic will be incapable of returning a fair profit be correct, it will of course be more or less money thrown away, if they introduce the steamers on their own account. Should they be inclined, however, to make the experiment on a small scale, for the purpose of encouraging private enterprise, we believe that a type of steamers suited (on a somewhat reduced scale) for the navigation of the Godavery during five or six months in the year, is to be found on the Indus.

Description of
vessels employed
on the Indus.

34. We therefore take the opportunity of furnishing the following information on the subject, for which we are indebted to Captain Wood, the superintendent of the Indus flotilla. The steam tugs of the flotilla are 212 feet long, 42 feet beam including paddles, and draw 3'--6". The engines are condensers, and have 120 nominal horse power.

35. A tug tows two flats, each 180 feet long, 22 feet beam, draught from 3 feet to 3'--6", and capable of carrying about 200 tons.

36. The cost of a tug and two flats, is about 32,000 £, delivered at Kotree on the Indus.

37. The flotilla consists of 11 tugs, 13 flats, and 20 barges, of an aggregate capacity of 2,925, tons. The capital is estimated at 500,000 £.

38. The

38. The receipts for half year ending 31st December 1865, amounted to 4,56,285 rupees, Receipts. the expenses to 3,38,650 rupees, the net receipts to 1,17,635 rupees, or 2·35 per cent. on the capital for the half year.

39. The quantity of goods conveyed during the half year was 12,320 tons; the receipts Traffic. to 8,98,508 rupees.

40. If we assume the average receipts per ton per mile at 1½ annas, this would be equivalent to nearly 7,500 tons carried over the whole distance from Kotree to Mooltan (570 miles), or 3,750 tons each way.

41. The voyages of the steamers are counted from the date they leave Kotree, and as between 1st January and 15th October 1865 (the latest date to which we possess the returns of traffic), 59 steamers had started from Kotree, the number of voyages accomplished during the year may be estimated at 70, or for the half year at 35. The duty performed by each steamer would therefore be approximately 107 tons carried up and down per trip, exclusive of passenger traffic.

42. The actual period during which steamers with a draught of from 3 to 3' 6" could ply upon the Godavery, is a matter of uncertainty, and would of course be liable to vary from year to year according to the character of the season, but it is not likely to extend much, if at all, beyond the five months between 20th June and 15th November. Of course a steamer of less draught could ply for a longer period, but it would be less effective during the monsoon, and as we frequently grounded in a boat drawing less than 18 inches in the beginning of March, 18 inches would be maximum water that could be counted on for a steamer, owing to its greater size and to the narrowness of the navigable channel at shoals up to the 15th February; and a steamer with a like draught which should be capable of plying up to that date, would thus extend the period of navigation from five to eight months, but the latter class of steamer would be incapable of working efficiently in the high freshes, and it may be questioned whether the aggregate performance would equal that of a steamer with three feet draught for a period of five months only; but our want of experience in steam navigation does not entitle us to speak with confidence on this point.

Period for which Godavery will be open for steamers.

43. In speaking of steam power, we have considered it in relation to the conveyance of a heavy traffic, and the prospects of its proving remunerative seems so very unpromising, that we have suggested great caution in trying any experiment. But our remarks do not apply to the use of small steamers for conveying passengers and a very limited quantity of valuable cargo for a few years, till the value of the navigation has become understood and appreciated by the public, and when private enterprise may be expected to take up the matter. Steamers for such a purpose, however, already exist on the Godavery, and they will certainly last for some years.

Steamers now employed on the works might be used for traffic for some years.

SECTION III.

PROBABLE TRAFFIC ON THE GODAVERY—II. BY COUNTRY BOATS.

44. WE now proceed to inquire to what extent traffic may be carried on by country boats, under the management of private owners.

45. The three months from 15th June to 15th September, which from the great depth of water in the river are favourable for the working of powerful steamers, are the most unfavourable period of the year for ordinary boats. During the south-west monsoon the wind is more or less contrary for boats proceeding up stream. There are very strong currents at the gorge between Doulaishwaram and the first barrier, and at various other places, and continuous towing is impracticable. In short, boats will probably not attempt to go up the river at that season, though if they were ready with a cargo at the foot of the third barrier, they could make a trip down the river. Should building yards be established in the vicinity of the forests around the third barrier, as we may expect will be the case, a considerable traffic might be carried on during the freshes at a very insignificant cost of transport, but the bulk of the regular up and down traffic would probably be confined to the period comprised between 15th September and the end of February, and for the smallest class of boats to a somewhat later date, or in all about six months. For about half that period the draught of the boats would be limited to two feet, on the average, if not less. They could of course travel at times when it would be impracticable for steamers of the same draught, as they would require a channel of less width, and the delays and interruptions which they would experience at the shoals, would not be of so much consequence to them.

The months of freshes unfavourable for boat traffic.

46. The boats most commonly used on the canals in the Delta have a capacity ranging from 10 to 35 tons, and the draught from two to four feet. They are generally of a nearly circular section and ill-adapted for shallow water. There is another description of boat which is used in small and shallow channels. It has a very small draught, and carries about two tons. Its shape is not unlike that of a shoe, and it is usually called a shoe dhony by Europeans. There are also cargo boats, for communicating with the shipping at Coconada,

Style of boats in use in the Delta.

which are built on the European model, and large boats, for passenger traffic, on the canals, which are also on a good pattern and built under native superintendence.

Boats could be transferred from canals to the river, and *vice versa*.

47. For navigating the Godavery the natives would probably make use of the boats to which they are already accustomed, at all events, in this first instance, and it may be assumed, with some degree of confidence, that their capacity will range from two to fifty tons. The larger boats would begin to ply in September, and the smaller would be had recourse to late in the season. When not employed on the river the boats would have to work on the Delta channels, and the interruptions of the river navigation would, therefore, not affect them injuriously. In this respect they would possess a great advantage over steamers, which would be lying idle for six months in the year.

Capacity of boats; and number plying on the Godavery Delta.

48. The average carrying capacity of the boats on the Delta, according to the Superintending Engineer, Captain Ryves, may be taken at $17\frac{1}{2}$ tons, and if we take this for the probable average for the Upper Godavery navigation between 15th September and 15th February, we cannot be far wrong.

From the returns obligingly furnished us by Captain Ryves, we learn that the number of boats licensed on the Godavery canals in 1865 was 1,101, viz., 1,023, cargo boats and 78 passenger boats. The aggregate capacity of the cargo boats was 17,500 tons.

Traffic in the Godavery Delta.

49. The goods traffic in the year 1865, on 58 miles of first class canal, amounted to 44,500 tons, carried over the whole distance; and on 142 miles of second class canal, 11,280 tons; or over the whole distance, of 300 miles, 28,782 tons. The total movement was thus nearly eight and three-quarter million of tons moved over one mile. This does not include the movement of unladen boats, so called, though many of them carried a small cargo. The passenger traffic amounted to about 620,000 persons, carried over a distance of 35 miles.

The season was not a favourable one for traffic, in consequence of there being a break of 13 miles, for three quarters of the year, on one of the principal canals.

Traffic on Kistna Delta.

50. From similar returns, obtained from Captain C. J. Smith, R.E., Executive Engineer, Bezwarah, we learn that on the first class canals, on the Kistna Delta, 125 miles in length, the traffic amounts to somewhat more than 1,500,000 of tons carried over one mile, or 12,000 tons carried over the whole distance, during the nine months of the year for which the canals are open. The number of boats licensed was 138. The average capacity 22 tons; but the licenses issued on the Godavery Delta (on which there are the greatest number of boat-owners), hold good also on the Kistna, and *vice versa*, and the boats pass in large numbers from one series of canals to the other.

Total movement in Deltas.

51. Combining the two returns, we find that the traffic on both Deltas, amounting to 10,500,000 of tons, moved over one mile, was carried on by 1,239 boats (including passenger boats) along 425 miles of canal; that along a portion of them, 158 miles in length, 44,500 tons was moved over each mile, and that along the whole length, 24,118 tons were moved, on the average, over each mile.

Rates of freight on Delta channels and on road.

52. The rates at which goods are conveyed on the Delta Canal, are as follows:—

Cotton, unpressed, 20 pies per ton per mile.

Salt, 5 pies per ton per mile.

Grain, 5 to $7\frac{1}{2}$ pies per ton per mile.

Oil seeds, 6 pies per ton per mile.

Rubble stone, 4 pies per ton per mile.

The average rate for all goods, excepting cotton, may be taken at 6 pies, or $\frac{1}{4}$ d. per ton per mile. The ordinary hire of a cart, capable of carrying half a ton, is $1\frac{1}{2}$ annas per mile, equal to 3 annas ($4\frac{1}{2}$ d.) per ton per mile. The saving, therefore, effected to the Delta districts by the canals, in carrying 10,250,000 of tons over one mile, was $2\frac{1}{2}$ annas per ton, or, in all, upwards of 16 lakhs of rupees.

Saving by the canals.

53. Metalled roads, to carry the traffic we have specified, could certainly not be constructed under an average rate of 10,000 rupees per mile, or maintained under 200 rupees per mile. The cost of 425 miles would, therefore, have been $42\frac{1}{2}$ lakhs of rupees, and the maintenance capitalised would represent a further expenditure of 17 lakhs.

Government and the public great gainers.

54. Without insisting on the precise accuracy of the above figures, we consider they are sufficiently true to prove that the Government and the public have derived vast benefits from the canals in the Deltas, and to prove that if similar results are obtained, by opening out the navigation of the river, the considerable outlay required for the purpose will have been well laid out.

Godavery traffic not likely to equal that of the Delta for a number of years.

55. We consider, however, that the traffic on the Godavery, along the whole length of a line of water communication, from Coconada to Chanda, 400 miles, is not likely to attain the standard of the Delta traffic, 24,000 tons over each mile of canal, for a considerable number of years.

It would be impossible to arrive at any precise results, seeing that the traffic has to be entirely created, but we should consider it rash to anticipate a more rapid development of trade along the Godavery than which has occurred in the Deltas.

The

The canals draw the produce of well-cultivated country. The revenue derived from the Godavery and Kistna districts united, amounted, in 1863, to 86 lakhs of rupees, and the land revenue alone to 69 lakhs. The vast area of the Central Provinces yielded, for the same year, a land revenue of 54½ lakhs of rupees, and a total revenue of 85½ lakhs. In the following year the land revenue was raised to nearly 55 lakhs, and the total to 90½ lakhs. The Delta canals intercept by far the largest portion of the traffic, to and from the coast, both within the limits of the two districts and the Nizam's territories beyond.

Madras Land Revenue Reports. 1863-64.

56. The Godavery navigation is carried through a wild and thinly populated country, and its terminus only rests on a country which is likely to supply any considerable amount of produce. Of course traffic would increase year by year; the improvement of the country along the Godavery itself would doubtless be greatly accelerated by the improvement in the communication. The fact, too, of the small land revenue of the Central Provinces, as compared with that of the Godavery and Kistna, shows what a field there is for improvement. Still improvements must be the work of time, and it would seem to us unreasonable to expect any considerable traffic on the river, under a period of 10 or 15 years after it shall have been opened for navigation.

Traffic can only spring up by slow degrees, owing to the smallness of the population.

57. The actual trade of the whole circle of the Central Provinces amounted, in 1864-65, to between 146,000 and 147,000 tons. (Imports 68,751 tons, exports 77,771). Of this aggregate, the trade with Northern India amounted to 66,579 tons, with Western India to 54,127 tons, with Southern India 1,841 tons, and with the Eastern Coast Districts 23,973 tons. The total trade of the Sironcha and Chandra districts for the same year, amounted to 6,315 tons, namely, imports, 4,681 tons, exports 1,634 tons, exclusive of 10,000 tons of timber exported from Sironcha, which article of trade, however, would not be much affected by the opening of the river.

Actual trade of Central Provinces and of Chandra Division. The Chief Commissioner's Report on trade and resources of the Central Provinces for 1864-65.

66,579
54,127
1,841
23,973

Total 1,46,522 tons.

58. There is, therefore, insufficient existing trade, in the districts immediately affected by the Godavery navigation, to yield a traffic equal to that now carried on on the Delta canals, even allowing for some additional aid from the Nizam's territories, but it is not less certain that the opening of the river will give a great impetus to the trade, and that it will have the effect of improving the condition and developing the resources of a vast tract of country.

Existing trade insignificant.

59. It will probably disappoint Government and the projectors of the Godavery scheme, to find that we entertain a view opposed to attempting navigation with large powerful steamers and barges, but it should not be inferred that the less pretending kind of navigation, for which we think the river best adapted, will be much less beneficial to the country. Except during freshes, the current of the Godavery is very much slacker than that of either the Ganges or Indus, and its channels, from the heavy coarse sand and shingle of which the bed is composed, is infinitely less variable. These most important advantages may prove more than sufficient to compensate for the comparative shallowness of the Godavery.

Country boats may achieve good results.

60. On the Ganges and the Indus we find that, notwithstanding the evident advantage that steam power has over native boats, in contending with the strong current, it has not prevented an extraordinary increase in the native boat traffic by means of the latter. From a return kindly furnished to us by Mr. Galiffe, the collector of canal tolls at Calcutta, we find that the boats passing through the canals, which we understand principally convey the through-traffic to and from Calcutta, have increased as follows:—

Boat traffic on the Ganges.

61. Boats above 25 maunds, from 1,26,350 to 2,04,585 in number, from the year 1854 to 1865. The tolls during the same period have increased from 2,13,140 rupees to 4,74,727 rupees.

28 maunds of 80 lbs. equal one ton.

Boats under 25 maunds, from 16,152 to 46,807 in number, from the year 1859 (up to which period there is no record) to 1865, and the tolls during the same period, from 1,009 rupees to 3,625 rupees.

62. On the Indus, we find, from information furnished by Mr. Howe, the conservator of the river, that the registry of boats shows an increase in their total burden, from 16,11,465 maunds in 1862, to 19,04,141 maunds in 1865.

Boat traffic on the Indus.

63. The rate of transit, by boats on the Ganges, is about five pies per ton per mile.

64. In 1852 the rate of transit on the Indus was ascertained to be only 4 pies per ton per mile, but the trade has increased, since that year, apparently more rapidly than the means of transport, and the rate of freight has consequently been enhanced.

65. On both the rivers steam power has been used for many years, and it will be evident, therefore, that if, as we consider to be the case, it cannot be advantageously used for heavy traffic on the Godavery, during the short period of the year when there is sufficient depth of water, there is no reason to suppose that the native boats will not carry such traffic economically and with advantage to the country.

Conclusions in favour of boat traffic on the Godavery.

66. We take this opportunity of stating that we have requested Mr. Howe to have a model prepared of one of the best light draught native boats used on the Upper Indus, which will be sent to the Godavery, that the construction may have a trial on the latter river.

SECTION IV.

WORKS AT THE FIRST BARRIER, COMPARISON OF TWO PROJECTS.

River open to Doomagoodiem only during high floods.

67. The section of the river between Doulaishwaram and Doomagoodiem can be navigated the whole way by steamers only during high freshes. For the greater part of the season they can ply only as far as the village of Golagoodiem, 24 miles below Doomagoodiem. The numerous rocks and rocky islets which protrude from various parts of the channel in the interval are the cause of this interruption; and, together with the similar but more intricate configuration of channel extending for several miles above Doomagoodiem, form what has been termed the first barrier.

Nature of works designed at first barrier.

68. The anicut which is in process of construction near Doomagoodiem is designed to submerge the rocks in the reach above, and by raising the water during the dry season to reduce the excavation of a channel to the lower extremity of the barrier. The canal which Major Haig projected was to extend from Doomagoodiem to Golagudiem; and, in conjunction with the pond above the anicut, was to form a line of navigation free from all obstruction from one end of the barrier to the other.

Estimated cost.

69. The estimate for these works was drawn up by Mr. Schmidt, C.E., and amounted to 35,05,200 rupees; or, excluding cost of establishments, to 30,25,203 rupees. Major Haig, considering it unnecessarily high, had a fresh one prepared after remodelling the plans of many of the works. He also lowered Mr. Schmidt's rates, the masonry from 28 rupees to 22 rupees per 100, and the earthwork from 10 rupees to 8½ rupees per 1,000. The revised estimate amounted to 16,34,287 rupees.

Modification lately proposed by Major Haig and approved by Government of India.

70. The subject was under the consideration of Government when Major Haig brought forward a proposal to cut short the line of canal at Gongole, two miles below Doomagoodiem, and to improve the river itself by blasting away the rocks from thence to Golagudiem. He calculated on obtaining by these means a sufficiently good navigation for steamers for four or five months, and for boats for a longer period. Further he considered that the shorter project would be necessary in any case, as the navigation by the canal to Golagudiem would be liable to occasional interruption from the occurrence of breaches in the embankment during extraordinarily high freshes. Steamers can already proceed to Gongole during the freshes; but when the river is low, small boats only can ascend. Major Haig did not intend that the longer line of canal should be abandoned finally; he only intended to substitute the less expensive project as a temporary measure, with a view to open up the river navigation more expeditiously, though less perfectly, than was possible by means of the complete project.

Opinion required as to its feasibility.

71. As, however, the Government of India have stated that they will be satisfied with a navigation open for steamers for four or five months, and for boats for several months longer, we have to express our opinion whether the modification proposed by Major Haig will effect this object.

Original project the most complete and perfect of the two, but would cost more than Major Haig anticipated.

72. Had the revised estimate, prepared under Major Haig's instructions, been sufficient to carry out the long canal in a satisfactory manner, we should not have hesitated to recommend it in preference to the short canal, combined with blasting operations in the river, as being the most complete and certain of the two projects. It has to be noted that a considerable portion of the work is already done; 12 miles of canal are finished; a lock is about one-third built, and some material has been collected for other works. Should the long line of canal be definitively abandoned, the expenditure incurred in these works will have been thrown away. But, judging from the rate at which the masonry works near Doomagoodiem are being carried on, we are of opinion that Major Haig's estimate would be largely exceeded; further, that it is not improbable that rock would be encountered to a larger extent on the canal excavation than was contemplated, and some additions to the works would sooner or later be necessary, especially to the embankment for protecting the canal from submersion by the river, which was only to be two yards wide at top, and four feet high above maximum flood level. The estimate originally prepared by Mr. Schmidt might admit of some modification as regards the quantity of work he provided for; but his rates do not appear to be too high, and his estimate probably represents the outlay required to carry out the project with a nearer approach to accuracy than that prepared by Major Haig.

Alternative project feasible, and will answer the purpose intended, but will have to be carried out carefully.

73. As regards the alternative project, we consider that it is quite feasible to clear a channel through the rocks in the river between Gongole and Golagudiem, so as to allow of the navigation being conducted within the limits required by Government. Portions of this route are already quite free from obstruction, and there are only three places where blasting of an extensive character is required. At two of these there are small rapids in the dry season, and, owing to the intricacy of the channel through the rocks, loaded boats cannot pass down stream without danger. But the fact of our having gone down in a boat 28 feet long and eight feet beam, in the middle of February, and of several small country boats having gone up and down at the same time, shows that the route is not altogether impracticable even in its present state, and every rock that is removed from the channel must serve to render the passage less difficult. At present boats have to follow a tortuous course, and unless carefully managed are liable to be thrown broadside on against the rocks

in mid-channel. The removal of such rocks is required to enable boats to pass up and down without danger; but we are of opinion that the operation is one that will need great judgment; and that unless a chart of the rocks is prepared beforehand, and the course of the improved channel is judiciously laid out, there will be great risk of failure. Several precautions are necessary. The rocks which obstruct the stream at the rapids act like the piers of a bridge, and hold up the water in the reaches above, in which there are pools of comparatively still water, offering no obstacle to navigation. The removal of the rocks in the rapids must tend, more or less, to lower the surface of the water in the pools, and if carried beyond the proper limit would have the effect of bringing rocks to light which had previously been submerged, and of increasing the current as well as the obstructions at the rapids or shoals higher up. To prevent the occurrence of such results, it is desirable that a channel of limited width should be cleared for summer navigation, and that a separate channel of greater width should be cleared for the passage of steamers and boats when the river is at a higher stage. In the latter, the rocks would not have to be removed to so low a level as those in the summer channel, and the alignment should be as free from bends, and follow the direction of the flood-streams as closely as possible. The summer channel, on the other hand, need not be so straight; but easy bends and footing for the men tracking up-stream, or lowering boats down-stream, will be requisite.

74. We have had no means of obtaining an accurate survey of this portion of the river, and can only indicate what we consider the most suitable course to be pursued. We would recommend that Mr. De Grousilliers, who is now in charge of the transport department, should be entrusted with the blasting operations. He has already had experience of this nature, and being thoroughly versed in all that relates to the navigation of the river, would understand exactly what standard of efficiency should be aimed at.

Mr. De Grousilliers competent to execute the work.

SECTION V.

WORKS AT THE FIRST BARRIER.

Past Expenditure and Outlay required to Complete the Works.

75. The project for surmounting the first barrier will now be limited to the anicut and scouring sluices in the river, a canal three miles in length, with locks at the extremities, and embanked against the river floods, and the clearance of a navigable channel in the river from the extremity of the canal to the village of Budrachellum. If this project is to be final, it is much to be regretted that it did not come under the consideration of Government for approval at an earlier period. The time and money which have been lost in the execution of works which are to be abandoned, would have sufficed not only to have rendered the first barrier passable by this time, but also to have advanced to some extent the works at the second barrier. Had the clearance of a channel through the rocks in the river been commenced in the first instance, the tramway might have been dispensed with, and the considerable expense required to maintain it for the purpose of conveying stores to the head-quarters at Doomagoodium rendered unnecessary, for steamers or boats might then have proceeded up the river to the immediate vicinity of the works.

Description of project as now curtailed.

76. Major Haig is not responsible for the expense on the tramways. They were ordered by the Madras Government in the expectation that they would, in combination with the open reaches of the river between the barriers, afford a means of conveying the cotton of the Central Provinces to Coconada at an earlier date than could be accomplished by a complete and unbroken water communication. But, as the Government are aware, the tramways were not completed round the three barriers; it was ascertained, while they were in progress, that they would not answer the expectation that had been formed of them; and on the recommendation of the Chief Commissioner they were accordingly suspended, but not before a large outlay had been incurred.

Tramways not comprised in Major Haig's original estimate.

77. There are other items of expenditure incurred on the Upper Godavery; as, for example, the cost of various exploring expeditions which really have no concern with the estimates which have from time to time been prepared by Major Haig to represent the cost of opening out the river. It is true that such expenditure must be classified as a charge on the Upper Godavery generally; but it would be unfair to Major Haig to include it in any comparison which may be formed between his estimates and the actual outlay incurred on the works, which alone they provided for.

Cost of various exploring expeditions form no part of the estimates.

78. In reviewing the past expenditure, the Government of India remarked upon the defective record of expenditure then before it, and give the following figures as the result of an examination as far as can be made out:—

Statement by Government of past expenditure.

Under Madras Government:		£.	s.	d.
1. From 1855 to 30th April 1863	- - - - -	151,562	-	-
Under Government of Central Provinces:				
2. From 1st May 1863 to 30th April 1865	- - - - -	134,513	-	-
TOTAL		£.	286,075	- -

Rs. 16,34,287.

79. The revised estimate for the long canal project provided for all the work done, and remaining to be done, subsequent to 1st May 1863.

Rs. 10,44,367.

The rough estimate for the shorter project is to be referred to the same date; and as the latter is not nearly finished, it must follow, from the expenditure up to the 30th April 1865 having amounted to upwards of 13 lakhs of rupees, that either the smaller estimate will be largely exceeded, or that a considerable expenditure has been incurred on the first project, which will have been thrown away.

A detailed statement of expenditure now furnished.

80. We shall endeavour to give an intelligible account of the expenditure, as it has actually been incurred from the commencement of the operations on the Upper Godavery up to a recent date, and shall then proceed to explain what further sum is required to complete the works at the first barrier.

Major Haig's account of expenditure up to 1st May 1863.

81. Major Haig has furnished Major Stoddard with an abstract of the outlay on the whole project, from January 1860, to 1st May 1863. It amounts to 13,78,597 rupees, and if to this we add the expenditure on exploring expeditions of previous years, viz.:

	Rs.
1855-56 - - - - -	1,30,396
1856-57 - - - - -	3,075
1859-60 - - - - -	1,383
	Rs. 1,34,854

the total, 15,13,452 rupees, so nearly corresponds with the figures obtained from the Madras Government, and specified in a preceding paragraph (15,15,620 rupees), that for purposes of illustration it may be taken as substantially correct.

82. Major Haig distributes the above-mentioned expenditure under the following heads:—

	Rs.	Rs.
Temporary works and blasting rock - - - - -	9,146	
Improvement to shoals - - - - -	7,208	
Exploring expeditions 1861-62 - - - - -	6,933	
Improvement of river between Doulaishwaram and Budrachellum - - - - -	52,598	75,885
STOCK:		
Steamers and Boats - - - - -	94,951	
Tools, Plant and Machinery - - - - -	1,77,051	
Live Stock - - - - -	4,902	
Materials - - - - -	39,207	3,16,111
TRAMWAYS:		
First barrier - - - - -	1,97,442	
Second ditto - - - - -	1,07,521	
Third ditto - - - - -	70,747	3,75,710
First barrier, anicut and canal - - - - -	-	3,93,426
Second barrier works - - - - -	-	7,452
Preliminary operations - - - - -	-	717
Survey of Wurda - - - - -	-	3,316
Station improvements - - - - -	-	21,176
Goods conveyed for private parties for which there should be corresponding credit - - - - -	-	9,900
Miscellaneous - - - - -	-	1,74,903
Establishment - - - - -	-	
	Rs.	13,78,596

Expenditure on works at the first barrier up to 1st May 1863.

83. The sum of 393,426 rupees would appear to be all that pertains to the project at the first barrier, and of this a considerable portion does not represent work done, but contingent expenses in accommodation for establishment and workmen, recruiting expenses, and other miscellaneous charges. The actual work done, cost 1,39,600 rupees on the anicut, and 1,20,782 rupees on the canal; total, 2,60,382 rupees; the miscellaneous charges were therefore about 50 per cent. additional.

Account of expenditure incurred subsequent to 1st May 1863.

84. As regards the expenditure incurred subsequently to 1st May 1863, we obtained from the executive engineer, Mr. Isaac, C.E., an account current exhibiting on one side the total sum he had drawn from the Treasury up to 31st December 1865, and the manner in which the whole sum had been disposed of on the other.

85. This

Per-centage of expenditure due to miscellaneous charges.

86. If the outlay incurred on accommodation for establishment, miscellaneous charges, and transport operations (V., VII., VIII.), Rs. 2,11,405. 15., be added to the expenditure on items I. II. and III., the cost of the works will be increased by about 34·65 per cent.

The expenditure would then be as follows, between 1st May 1863, and 31st December 1865:

ANICUT and SHORT CANAL PROJECT.										Rs.	a.	p.
Works	-	-	-	-	-	-	-	-	-	3,52,991	15	11
Miscellaneous charges	-	-	-	-	-	-	-	-	-	1,22,212	15	-
										4,75,204	14	11
ADDITIONAL ON LONG CANAL.												
Works	-	-	-	-	-	-	-	-	-	1,81,371	4	11
Miscellaneous charges	-	-	-	-	-	-	-	-	-	62,803	-	-
										2,44,174	4	11
TRAMWAY.												
Works	-	-	-	-	-	-	-	-	-	76,350	11	10
Miscellaneous charges	-	-	-	-	-	-	-	-	-	26,411	-	-
										1,02,761	11	10
										3,93,426	-	-
										4,75,204	14	11
Or, in all - - Rs.										8,68,630	14	11

Total expenditure on the anicut and short canal.

87. We have previously explained that prior to 1st May 1863, the expenditure on the Anicut and canal had amounted to

The total expenditure to 31st December 1865, was therefore in addition - - - - -

Expenditure on tramways and on portion of canal which will be abandoned.

The expenditure incurred on the portion of the long line of canal, which is to be abandoned, represents a loss of about $2\frac{1}{2}$ lakhs of rupees; and the tramways on which there has been an outlay in all of about $4\frac{3}{4}$ lakhs, though they have been to a certain extent useful, so far as the work of the first barrier is concerned, must be pronounced in the main to be unprofitable works.*

High charges for establishment, tools and plant.

88. The other items of expenditure, the Government will observe, are chiefly comprised of charges for establishment and for tools and plant. These are extraordinarily heavy, and will be alluded to again, when we speak of the future more economical management of the works.

Expenditure compared with estimates.

89. We have already observed that the estimates which have lately been under the consideration of Government, date from 1st May 1863, and include none of the outlay incurred prior to that date. We have also explained that the expenditure on the anicut and short canal project for the first barrier, exclusive of miscellaneous charges between 1st May 1863 and 31st December 1865, amounted to Rs. 3,52,991. 15. 11, and inclusive of them, to 4,75,205 rupees.

We propose now to consider these amounts with reference to the estimates, and to calculate approximately what further expenditure will be required for the completion of the works provided for.

1st. Anicut at Doomagoodium.

Anicut at Doomagoodium and subsidiary works.

90. It appears from the Progress Report up to 31st May 1865, since which date no work has been done, that 44·35 per cent. of the masonry work had been completed. As the expenditure has amounted to 1,26,723 rupees, and the estimate to 2,20,914 rupees, the cost of completing the remainder of the work at the past rate, would be 2,86,000 rupees; but as adequate provision was not made in the estimate for crossing the deep bed of the river, and for the temporary embankment which will be required to aid the final closing of the dam, and as a considerable addition is required in the north flank of the anicut, in the shape of rough stone groins or pitching, to prevent it from being turned, we question whether the cost of the work will fall short of 3,20,000 rupees.

2nd. *Scouring Sluice*—Is completed at a cost of Rs. 91,743. 7. 5 against the estimate of 71,430 rupees; excess, Rs. 20,313. 7. 5.

3rd. Flood

* Note—The Superintendent of the transport operations draws up an annual statement of receipts and charges; but his accounts of expenditure comprise only the pay of the establishment, and other expenses connected with the actual working of the steamers and tramway. The cost of the plant, of accommodation for stores and maintenance of the tramway, does not appear in the annual statement, hence the rates at which stores of different kinds are said to be conveyed are, to some extent, fictitious.

3rd. Flood embankments and removing obstructions in river bed have cost Rs. 20,354. 1. 7.

4th. Head lock—expenditure, Rs. 53,427. 15. 3; estimate, 97,705 rupees.

It appears that the rubble masonry on the last-named work is costing 28·3 per 100 cubic feet, instead of the estimated rate 22, and that the cutstone is likely to cost 100 rupees per 100 instead of 75, and that the contingencies are costing 10 per cent. instead of 5. We question if the whole of the rubble masonry will be constructed under 30 rupees per 100; and we estimate the probable cost of the whole work at 1,24,735 rupees.

5th. For the short canal from the head lock to Gongole, we accept Lieutenant Roberts' estimate as approximately correct; it amounts to 1,74,956 rupees.

6th. The tail lock at Gongole, if reduced to a width of 20 feet and a length of 150, instead of 30 feet by 200, will cost about one-third less than Lieutenant Roberts' estimate of 2,35,690 rupees, or 1,60,000 rupees.

91. The above estimate may thus be summarised :

Total of estimates.

	Rs.	a.	p.
Anicut - - - - -	3,20,000	-	-
Scouring sluice - - - - -	91,743	7	5
Flood embankments, &c. - - - - -	20,354	1	7
Head lock - - - - -	1,24,735	-	-
Short canal - - - - -	1,74,956	-	-
Tail locks at Gongole - - - - -	1,60,000	-	-
	8,91,788	-	-
To this must be added 33½ per cent. to cover miscellaneous charges of the nature we have described above - - - - -	2,97,263	-	-
Rs.	11,89,051	-	-

92. To this must be added the cost of blasting operations in the river, of which we can form no estimate that can be relied on; but we imagine it will exceed 50,000 rupees, and may rise to 100,000. If the latter, the probable total cost of the project would be 12,89,000 rupees, or say 13 lakhs; of which has been expended, as already explained, Rs. 3,52,992 plus miscellaneous charges - - - - - 1,22,213

Clearance of rocks in the river.

Or - - - Rs. 4,75,205

93. If to the above estimate of 12,89,000 rupees be added the expenditure incurred on the anicut and canal prior to 1st May 1863, 3,93,426 rupees, the total probable cost of the work will be ascertained, viz., 16,82,426 rupees.

Expenditure prior to 1st May 1863, to be added to amount of estimates. Probable cost compared with estimate.

The Government of India counted on an expenditure of 10,44,367 rupees on carrying out the short project, but exclusive of that incurred before 1st May 1863. If we add that sum, the total will be 14,37,793 rupees, or about 2½ lakhs less than the amount of the estimate we have given above.

94. We have to remark, that without taking into account the extra charges, the rates at which the works at the first barrier are being executed is excessively high. The workmen are of a very inferior stamp. Good masons, of which only a very limited number are available in most of the districts in the Madras Presidency, can readily find employment without leaving their homes, and the class of workmen who are skilled in excavation, will not leave their own districts. Further, such large concessions have been made to the workmen that they have become spoilt. They readily understand as a considerable outlay had been incurred to collect them on the work, that it must be the interest of the executive officers to keep them upon it; and that the latter will be prepared to give them easy terms, rather than see them desert. The result is, that there is little command over them, and that they cannot be induced to furnish a fair day's work for their ample wages. We learnt that a mason built about nine cubic feet of rubble masonry a day. This is about a third of what is expected under ordinary circumstances; and as the other labour charges for the masonry work would increase nearly in proportion to the expense of the masons, the work costs about two and a half times as much as similar work on the Deltas. The miscellaneous charges which we have shown, amount to between 30 and 40 per cent on the purely construction expenses, and the total cost becomes therefore nearly three and half times as much as similar work on the Deltas.

High rates of work, and causes thereof.

95. We are far from attributing these heavy charges to a want of economical management on the part of the officers. We believe that in Major Haig and the executive officers generally, the Upper Godavery has been fortunate in having a more than usually efficient engineering staff, and that the high cost of the works is the natural consequence of the very unfavourable conditions under which they have been prosecuted. It was quite impossible

High rates not attributable to want of management on the part of the engineering staff.

that the estimates, at all events the earlier ones, should have had any pretension to accuracy. The whole of the workmen had to be recruited from a distance; they had to be paid during the journey; many deserted almost within sight of their destination; and, in some cases, the stoppage of funds obliged the officers to discharge a number of the men who had thus been collected at a heavy cost. The hutting is an unusually heavy item. In most cases it would suffice to give the workmen a small sum to enable them to house themselves; but the extreme unhealthiness of the country along the Godavery, rendered desirable a more regular alignment and more careful style of construction, than could be entrusted to the workmen to carry out themselves. The workmen had also to get batta when in hospital, during rainy days, or on other occasions when the work might be stopped.

Budget rules act unfavourably on the works.

96. These causes are quite sufficient to account for the expensive style of the work on the Upper Godavery, and they have no doubt been enhanced by the stringency of the budget rules, and a want of knowledge on the part of the officers, as to the funds they might calculate on obtaining, which prevented them from knowing what number of workmen they could count on employing permanently, for the performance of the work in the most economical manner.

Quality of the work.

97. We have to add a few remarks expressive of our opinion as to the efficiency of the several works at the first barrier.

Anicut.

The anicut across the river is about one-half built. It is a simple rubble masonry wall based on a rock foundation, and cannot fail to be durable and inexpensive to maintain. The cement which is used on this and the other masonry works, is of the most excellent quality, far superior to the mortar generally used in other parts of India.

The only difficult portion of the anicut has, however, yet to be built, and the damming off of the water by means of temporary bunds to allow of the wall being carried across the deepest portion of the bed, must be a troublesome and expensive operation. It is worthy of consideration whether instead of continuing the anicut in a straight line to the west bank of the river, as provided for in Major Haig's design, it would not be better to deflect the flank more up-stream, to take advantage of a more favourable configuration of the rocky bed of the river. Major Haig has himself suggested this modification, and it will, probably, render the final closing of the deep portion less difficult and expensive.

Additions required.

98. The east flank of the anicut abuts on an island formed of alluvial soil. The head of this island is about half a mile higher up the stream, and the channel between it, and the main land is intended to form the navigable approach to the head of the canal at the distance of a mile below the flank of the anicut. We consider it would have been preferable to have continued the anicut in a straight line to the main bank of the river, and to have opened the canal on its flank, or to have followed the plan originally proposed (1856) by Major Haig, of constructing the lock at the head of the island, and of turning the branch between it and the main land, into a portion of the canal. According to the present arrangement, the flank of the anicut is not secure from the encroachment of the river, and a breach has already been formed through the island almost close to the anicut. It will now be necessary, in order to protect the island from further erosion, and to prevent the flank of the anicut from being turned, either torevet the head of the island with rough stone pitching, or to construct a masonry wall in continuation of the anicut, as far as the branch channel. As rock is available for the foundations, neither work will be of an expensive character. We have provided for it in the estimate we have already given for the completion of the anicut, and also for a slight addition to the height of the embankment connecting the flank of the anicut with the head lock.

Head lock.

99. As regards the other works, we have only to remark, that the lock at the head of the canal must by this time be nearly completed. It is 200 feet long and 30 feet wide, and if our suggestion to limit the capacity of the locks on the Godavery navigation to 150 feet by 20 feet be approved, it will be too late to make any alteration in the head lock, further than to contract the width in the immediate vicinity of the gates, and to cut the latter down to 20 feet. They would be so much more manageable than gates 30 feet in width, under the considerable head of water to which they will be exposed during the high floods, that we do not hesitate to recommend this alteration.

SECTION VI.

WORKS AT THE SECOND BARRIER.

Style of anicut proposed by Major

100. THE anicut which Major Haig proposes for the second barrier, is to be formed of a mass of loose stone thrown in blocks and pieces of all sizes, from what a man can carry, up to 10 tons in weight. He considers that a rate of Rs. 6. 8 per 100, will suffice to cover the whole expense of this work. He ascertained that the rate that prevailed at the Kistna Anicut, which was constructed upwards of 10 years ago, for quarrying and delivery was Rs. 2. 3. 6 per 100, and he had doubled this rate, and added 2 per 100 to cover the cost of tramways, plant, and hutting workmen.

101. On

101. On reference to the Statement of Expenditure on the Kistna anicut as it approached completion, we find that actual cost of the rough stone were 10·9 annas per cubic yard, and that the proportional charge for plant would increase the cost by 3·38 annas per cubic yard. The total cost was therefore 14·28 annas per cubic yard. Now the quarries at the Bezwarra anicut are in close proximity to the work, and on both sides of the river, while the average distance of the quarries at the second barrier will not be less than a mile, and the facilities of working are far less than at Bezwarra. At the present day, the anicut at Bezwarra could not be constructed so cheaply as it was 10 or 12 years ago. Again, Major Haig proposes to throw in stones up to 10 tons in weight. None of the stone used on the Kistna anicut exceeds five or six tons, and blocks of that size are exceptional. We do not think that the labour and expense of manipulating stones of the enormous weight of 10 tons, or of carrying them along a common tramway, has been fully appreciated by Major Haig. We consider that in practice such heavy material would have to be avoided, and that the upper course of stone would instead have to be carefully packed.

Professional papers Madras Engineers. Volume IV. page 70, rates compared with those of Kistna anicut.

102. For similar work at the Kistna anicut at the present enhanced rates, we think it highly improbable the whole mass of the rough stone work, including the packing of the upper course, could be thrown in, for a less rate than Rs. 1. 8. per cubic yard, or about Rs. 5. 8 per 100 cubic feet.

Probable cost of rough stone for the Kistna anicut at the present day.

103. We have seen that the cost of the work at the first barrier, inclusive of all charges, is upwards of three times that of similar work in the Deltas. We see no reason to conclude that the work, second barrier, will be in a much lower proportion. It is true that a larger number of workmen will probably be obtained from no great distance, and that food may also be obtained with greater facilities than was the case at the first barrier. But the country is fully as wild as that at Doomagoodiem; it is not likely to prove less unhealthy; and though the cost of hutting and other charges may be on a less liberal scale, a considerable allowance must still be made.

Liberal allowance must be made for Contingent expenses.

104. It is impossible to know precisely beforehand what work will actually cost when there are really no data on the spot for any calculation; but the experience gained at the first barrier would lead us to the conclusion that the rough stone work is not likely to cost less than three times what we have shown to be the probable cost of similar work at the Kistna anicut, or about 16 rupees per 100 cubic feet, instead of Rs. 6. 8. as computed by Major Haig; but if Major Haig's anticipations of effecting a reduction on the charges for labour, recruiting, &c., are realised, and taking his standard of probable expense of rough stone, as compared with the work at the Kistna, after the corrections we have made above, the cost will still be 11 rupees per 100 cubic feet, and the total expense of the rough stone work of the anicut, would be 10,37,000 rupees, instead of 6,12,775, as computed by Major Haig.

Expense of rough stone would be much in excess of Major Haig's rates.

105. As might be expected, we are also of opinion, that his rates for masonry work are too low. Major Haig assumes that a rate of 21 rupees per 100 for rubble masonry was sufficient for the work at the first barrier, and that a reduction of 3 rupees per 100 would be effected at the second barrier, in consequence of the greater facility of obtaining materials, and of labour being procurable at lower rates. But in reality the rate at which rubble masonry is being carried out at the first barrier, is nearly 30 rupees per 100 instead of 21, and if a reduction is effected as anticipated by Major Haig, it would still leave the rate nearly 26 rupees per 100, and to this must be added the percentage due to hutting, batta, transport charges, and other extraordinary expenses. These latter charges may possibly, however, be largely reduced in the case of the second barrier works, especially if the Deputy Commissioner of Sironcha can induce merchants to establish shops to supply the workmen with food. But still allowing for such a reduction, we think that the estimated rate should not be lower than 30.

Major Haig's rates for masonry also too low.

106. If the plan of anicut proposed by Major Haig is adhered to, it thus appears that the outlay required for overcoming the difficulties at the second barrier, will be much in excess of his estimate. We are of opinion, however, that there are serious objections, independently of the expense, against the construction of a rough stone weir, intended to withstand a pressure of 40* feet head of water. We are quite satisfied that the leakage would be so great that it might be quite impossible to pond up the water to the requisite height when the supply in the river would be small. Major Haig considers that there is no single objection to such a work in an engineering point of view, and from his not mentioning in his report, No. 58, dated 24th May 1864, that the rough stone dam would have to be carried across the deep bed of the river for a distance of 170 feet, and where consequently the full head due to the pressure of 40 feet of water would act against it, he evidently made light of what appears to us a serious difficulty. If the use of very large blocks of stone were found to be economically impracticable, the repairs of a rough stone dam would be heavy. The floods of the Kistna dislodge a considerable portion of the packing of the anicut at Bezwarra, and a number of the large blocks of cut stone from the coping of the front wall. In one year, a hole 250 feet long, 50 feet wide, and a depth up to eight or nine feet was formed in the rough stone work. The repairs of damage of this nature are not however very expensive, owing to the very low rate at which stone is procurable. The proposed dam at the second barrier is about double the height

Engineering objections to a rough stone anicut for second barrier.

* 37 feet stone work, and 3 feet planting.

height above low water of the Bezwarra anicut. The rise and volume of the Godavery flood is double that of the Kistna, while the length of both dams is almost the same. At full flood the depth of water, and the quantity discharged along each running foot of the second barrier anicut, would be double, similar quantities at Bezwarra. The velocity would therefore be the same in both cases. But the Kistna anicut is only 16 to 18 feet high above summer level, while the solid portion of the proposed anicut at the second barrier is to be 37 feet, so that when the water is ponded up in summer at the latter work, the difference of level between the upper and lower pools will be double what it is at Bezwarra. At extreme floods, the afflux or difference of level, between the up and down stream surfaces, will be nearly reduced to an equality in the two cases, and in neither would probably exceed $1\frac{1}{2}$ or at most 2 feet. So that in the Bezwarra anicut, we should have between high and low stages of the river, a difference of level in the upper and lower reaches, ranging between 1 and 18 feet, and in the second barrier anicut, a difference ranging between $1\frac{1}{2}$ and 37 feet. We must therefore conclude, that the afflux during moderate floods, would be much greater at the proposed anicut than is the case at Bezwarra; that the velocity would be greater, and that the action on the rough stone work would therefore be more severe. On the grounds both of economy and efficiency, therefore, we recommend the substitution of a solid masonry work, with a vertical fall. Major Haig, in para. 11 of his report, states that the rock is not of sufficient hardness; but we have carefully examined the rock, and taking into consideration that of the whole length of the dam, 367 out of 1,000 feet are to be less than 12 feet high, and that 2,300 feet more, less than 22 (on the average), we believe that any serious injury need not be apprehended, and it would not be a very expensive operation to reduce the destructive action of the overfall by means of a second dam of about half the width and height of the main dam, built 50 or 100 feet in rear of it, and thus forming a pool for the water to fall into. The remarkable configuration of the bed of the river, strata of slate running parallel to the banks, and presenting a serrated outline on cross section, gives great facilities for the construction of secondary dams in rear of the main one, on different levels, to suit the varying height of the rock; the ridges of rock forming ready-made partition walls, nearly at right angles to the line of the dam, which would prevent the water in the different pools from communicating, and thus from falling to a uniform level.

A solid masonry weir preferable.

107. The construction of a solid masonry dam would be an easy operation along all parts of the bed, excepting for a distance of 170 feet, where, as already mentioned, the river has scooped out a deep channel. The depth of water in summer is 14 feet at the centre, and the average is about 12 feet. As the anicut is to be 37 feet high above summer level, the total height of the masonry for a distance of 170 feet would thus be close on 50 feet.

Crossing the deep bed of the river the only difficulty.

108. It would be hopeless to attempt to bale out the water from the pool, after the stream should have been diverted into one of the secondary channels, and it appears to us that the simplest and most efficacious mode of proceeding, will be to build the foundation of concrete in the water. The width of the base would be upwards of 40 feet, and we would propose to build the faces to the proper slope by means of caissons (or boxes without top or bottom). The hydraulic cement prepared for the Upper Godavery works is of so excellent a quality that a concrete foundation of the kind we have described would be equal, if not superior, to any rubble masonry that could be built.

Nature of work proposed.

109. The masonry wall at the deep channel would be 36 feet high from the base to the general level of the crest of the proposed dam, and we purpose to give it a width of 30 feet at base and 10 feet at top.* The water, when the lower pool would be at its minimum, would fall from a height of 37 feet, and the depth of the pool is 12 feet. This would seem to break the force of the falling stream to some extent, and thus to protect the foundation; but it would add considerably to the expense, and cause great additional delay if a second wall were built to pond up the water to a greater height, in a manner proposed along the rest of the anicut where the bed of the river is high; and we consider it advisable to obtain the necessary additional security to the foundations, by preventing the water flowing over the crest of this portion of the work, until the depth in the lower pool shall have increased. We calculate, that when a depth of three feet of water is passing over the crest of the anicut, the surface in the lower pool will be upwards of 20 feet above the summer level. We would therefore propose to build up the portion of the work along the deep channel, say for 200 feet, in all three feet higher than the remaining 3,470 feet; and as the water in rising above this level would then fall into a pool upwards of 30 feet deep, there would be no reason to apprehend any injury to the foundation.

Proposed alterations could be carried out within the amount of Major Haig's estimate.

110. We have observed before, that the height of the anicut for 2,300 out of 3,670, will be less than 22 feet. For a considerable part of that distance it would be very much less, and the average for the whole is considerably under 22 feet. An anicut with a mean thickness of 14 feet, 24 feet high, would at the liberal rate of 30 rupees per 100 cubic feet, cost 100 rupees per running foot. Major Haig's estimate for the rough stone work was at the rate of 170 rupees per running foot, and that rate, as we have explained, is too low. It would thus appear that the masonry dam, is the less costly style of work of the

* NOTE.—The width of crest should not be less than 10 feet. An accident lately occurred to a dam across the Kistna in the Sattara District, of which the width of crest was 8 feet. A large mango tree was brought down by the floods, and in passing over the dam, carried away the masonry to a depth averaging six or seven feet, and to a width of 45 feet.

the two; and we are of opinion that both it and the smaller wall in rear, which we think necessary for forming a pool to break the force of the water in falling, may be carried out for less than the amount of Major Haig's estimate for the rough stone dam, allowing also for the extra cost of coping the deep bed. Major Haig's rates for masonry being nearly two-thirds only what it is likely to cost, an excess would occur in the construction of the locks or sluices; but if our recommendation to cut down the size of the locks from 200 by 30 to 150 by 20, meets with approval, the saving thus effected will serve to balance the under-estimate of rates, and thus allow of the whole work being carried out for the amount of the estimate.

111. We consider the under sluice wall might be strengthened with advantage, and that a pool should be formed in rear, similar to that above recommended for the body of the anicut. It is to be observed, that there will be a head at times of fully 10 feet of water on the under sluice vents, and the water would then issue with a much higher velocity than rough stone work would stand.

Additions required to under sluices.

SECTION VII.

IMPROVEMENTS TO THE RIVER BED BETWEEN THE BARRIERS.

112. IN Resolution No. 930—3 C., dated 13th September 1865, para. 9, the sum set down for works between the second and third barriers is 6,50,000 rupees. Major Haig, in his report, dated 3rd May 1866, states in paragraph 207, when speaking of the total probable cost of all the works, excepting storage required for the Godavery, that the removal of rocks, &c., from the river bed will cost 1,40,000 rupees.

References to former estimates.

113. In subsequent reports, Major Haig speaks of groins to contract the river at wide places and increase the depth of water; and the Chief Commissioner in his report on the Godavery, dated 23rd January 1863, mentions the probable cost 6,50,000 rupees, which includes 3,50,000 rupees for groins. This corresponds with the sum set down by Government.

Expenditure on groins deprecated.

But in the present state of knowledge of the navigability of the river, except at the particular times when a voyage has been made, we deprecate any outlay whatever for groins. For protecting the bank of a river they are simple enough; but for contracting a river to increase the depth of water, without at the same time injuring an adjoining reach, they are not so simple; and without a most careful survey and complete information of the river in all conditions of its stream, large sums may be entirely thrown away.

114. With respect to the clearance of rocks, which alone should now be undertaken, the same care would be necessary as in the case of the rocks near Budrachellum. The clearance may be overdone, and the depth of water seriously reduced above the obstructions. There are three points between the first and second barriers, where rock offers a serious obstruction to the navigation, when the supply of water is small. Proceeding up stream, the first spot is about 12 miles above the first barrier. A narrow ridge or reef of rocks runs completely across the river. The second point, Albaka, 20 miles higher up, is well known; and the rocks extend longitudinally for about a mile, over which there is an ascent of about seven feet when the river is low. The third point is at Jyoorpettah, about 10 miles below the foot of the second barrier; the obstruction is like the first one, merely a narrow ridge of rock, which produces a short rapid, with a descent of about three feet.

Nature of obstructions between the barriers which require to be removed.

115. At the first and third points, a passage merely wide and deep enough for the largest size boat that can navigate the river when the stream is low is required, and to facilitate warping up or lowering down stream, ring bolts should be fixed to the rock above the rapid, and opposite the shoot, because the chief difficulty is caused from the insecure footing the boatmen get upon the slippery rocks, and the awkward angle at which they are obliged to track, which doubles the labour and makes the steering of the boat very difficult.

116. At the second point, Albaka, the same plan should be adopted that we have recommended for Budrachellum. A narrow passage should be provided for boats when the river is low, and a wider passage at a higher level for both boats and steamers when the river is higher. In the first, the channel may wind through the rocks, and ring bolts should be fixed at convenient intervals to facilitate warping. In the second, the channel should be as straight as possible, and follow the direction of the current, as the velocity will be very great down it, and the steering must be rendered as easy as possible.

Obstruction at Albaka, how to be treated.

117. In all other places where the removal of rocks is necessary, the quantity of work to be done is comparatively small. These rocks rather endanger navigation than obstruct it, and their removal will be a matter of no difficulty.

Detached rocks here and there to be removed.

118. The removal of the rocks, both where they occur in ridges and detached, may be deferred till the work at Budrachellum is completed.

Probable cost.

119. There are also detached rocks which occur below the first barrier and between the second and third which should be removed; and altogether, we do not think the expense will be less than the sum mentioned by the Chief Commissioner, excluding the cost of the groins, viz., Rs. 6,50,000 — Rs. 3,50,000 = Rs. 3,00,000.

Total probable outlay required for the works from 1st May 1863.

120. Probable cost of navigation works to foot of third barrier, exclusive of expenditure incurred prior to 1st May 1863:

	Rs.
First barrier works - - - - -	12,00,000
Rocks at and above Budrachellum - - - - -	1,00,000
Rocks between first and third barrier - - - - -	3,00,000
Second barrier works - - - - -	12,00,000
TOTAL - - - - -	28,00,000

SECTION VIII.

GENERAL REMARKS ON EXPENDITURE.

Disproportional cost of establishments plant, &c.

121. THE experience obtained on the Upper Godavery has been dearly bought, but there is still time to turn it to account in the completion of the works at the first barrier and the execution of the other works not yet commenced. An analysis of the expenditure upon the works up to 31st December 1865, shows an extraordinary disproportion between the outlay for actual work and that for establishment, plant, &c.

The following are the various items which, collected under the different heads from previous paras. show the expenditure since the Godavery was first examined in 1853 by Major F. Cotton up to 31st December 1865:—

	Rs.
Actual work on canal or in river bed - - - - -	8,63,696
Tramways - - - - -	3,75,710
Improvement and repair of tramways - - - - -	76,350
Steamers and boats - - - - -	1,20,329
Tools, plant, and machinery - - - - -	2,52,234
Live stock - - - - -	4,902
Materials in stock and advances - - - - -	1,25,719
Miscellaneous charges, hutting, recruiting, &c. - - - - -	2,64,367
Preliminary operations at second barrier - - - - -	7,452
Station improvements - - - - -	31,586
Establishment - - - - -	4,96,457
Accommodation for establishment - - - - -	39,250
Buildings for grain and for transport departments - - - - -	25,353
Exploring expeditions and surveys - - - - -	1,43,169
Balance due for goods conveyed by transport department for private parties - - - - -	21,176
Rs.	28,47,750

Note 1.—The item improvement and repair of tramway is for maintaining the tramway at first barrier for the prosecution of works.

Note 2.—Under the head of Exploring Expeditions and Surveys, is included some expenditure incurred for clearing rocks. It is not charged under the head of works, because it was executed prior to the regular commencement of the first barrier works, and forms no part of the project.

Tramway at first barrier should not be maintained.

122. A large proportion of the outlay for tramways is for iron rails, and some portion of this is recoverable by the sale of iron. The construction was too light in the first instance, and the expense of maintenance and the heavy cost of transit for conveying such a limited quantity of traffic as suffices for the works, make the tramway a very heavy drain upon the resources, and we recommend that it should be taken up and the iron disposed of. The number of workmen now engaged on the works may easily be supplied with grain by river transport for seven months in the year, and during the remaining five months the grain may be conveyed to Budrachellum by boat, and thence to Doomagoodiem, a distance of 14 miles, by bullocks.

123. The outlay for steamers and boats was, of course, necessary for the navigation, and we have no remark to make upon it.

Costly machinery to be avoided.

124. The cost of tools, plant, and machinery, is disproportionate to the expenditure on work. As the expense has been incurred, there is no course but to use the machinery; but whenever it gets seriously out of order and is expensive to maintain, it should be replaced by the ordinary bullock power machines; and we recommend that no additional plant

plant or machinery be ordered from England, either for works at the first or second barrier. There is abundance of cattle power obtainable on the Godavery, and in a bad climate which renders establishments costly, tramway and machinery which require much supervision and skilful treatment should be used as little as possible.

125. Under the head of materials in stock and advances, there is, we fear, a considerable sum which is not recoverable. Tramways were laid to two quarries which proved to be useless, the stone being too soft. In so wild a country as the Godavery, the engineer has a serious difficulty to contend with, in not possessing reliable information respecting the nature of the stone procurable; but a more careful examination should have been made before laying down tramways. Losses.

126. The miscellaneous charges are very heavy, and we have already in a previous para. explained that the system of obtaining labourers does not answer. At the first barrier the people have got accustomed to expect aid of all kinds, and it will be somewhat difficult to effect an entire change now; but still every opportunity should be taken by the executive officers to place the labourers on a footing more nearly corresponding with that which obtains on other public works. At the second barrier works, the ordinary plan should be tried of giving the people liberal wages, and trusting more to their coming to the works without other inducement. Experience has shown that it would be infinitely more economical to commence with a small beginning with a minimum establishment, than to attempt at once to collect a very large body of workmen. System of recruiting should be changed

127. The cost of the establishment employed on the works at the first barrier has been most disproportionate to the expenditure on the works, and to the amount done, and we would recommend an immediate reduction. At present it is as follows:— Unnecessarily large establishment.

- One executive engineer.
- One assistant engineer on the works.
- One assistant engineer in charge of workshops, machinery, and tramway.
- One sub-engineer on the works.

TRANSPORT DEPARTMENT.—(Exclusive of Officers on Steamers.)

- One superintendent.
- One assistant superintendent.

There are other assistants in the transport department, but as they are not stationed near the works we have not included them.

128. The works now to be executed consist of—
 Completion of anicut. A gap of about 1,000 feet in length to be closed.
 Completion of short canal two miles in length, with its locks, one single and one double.
 Blasting rocks to form clear channels in the river, to a distance of 12 miles from the canal works.

129. The difficulty of collecting a very large body of labourers is as great as ever, and considering the moderate number that is likely to be engaged, and the circumstance of the works all being comprised within a space of a few miles, we are of opinion that the following establishment should suffice, exclusive of overseers:— Reduction recommended.

- One executive engineer.
- One assistant engineer.
- One sub-engineer.

TRANSPORT and SUPPLY DEPARTMENTS.

1. Assistant Superintendent.

130. We have in another part of our report recommended that the blasting of the rocks in the bed of the river should be entrusted to Mr. De Grousilliers, of whose intelligence and zeal we entertain a very high opinion, and as he has already been engaged in the construction of the anicut, and has a most thorough acquaintance with the nature of the works now in course of execution on the canal, we would further recommend that he be appointed executive engineer at the first barrier, and that he should retain the general management of the transport department, which will now be reduced to the steamers on the river. In this duty he will have the valuable aid of Captain Barber, who has a thorough acquaintance with the navigation of the river. The assistant we recommend under the head of transport and supply will attend to the supply of grain for the workpeople under Mr. De Grousilliers' direction, and should reside near the works, instead of at Golagoodiem as at present.

131. This arrangement would enable Government to appoint Lieutenant Roberts, at present executive engineer, and one assistant engineer, to the charge of the second barrier works, where there are engineering difficulties which will call for a great deal of attention.

(signed) J. C. Anderson, Lieutenant Colonel,
 Royal Engineers.
 (signed) J. G. Fife, Lieutenant Colonel,
 Royal Engineers.

Roorkee, 27 June 1866.

APPENDIX (A.)

NOTES OF JOURNEY up the GODAVERY RIVER.

1st February 1866. Started at 7 p.m. from Cocanada in the "Fawn," a very small steamer eight horse power, and drawing barely two feet of water. Proceeded by the Samulcottah Canal to Dowlaishwaram, which was reached at 2 a.m. 2nd February, distance 39 miles. The "Fawn's" greatest speed, with steam well up, is only six miles per hour, and she very seldom does this.

2nd February. Started at noon and ran up the Godavery to Danputnum, which we reached at 8 p.m., distance about 30 miles by river. The stream at this season is generally from one-half to three quarters of a mile wide, except at the shoals, where the sandbanks reduce it to a few hundred feet. We grounded three times, but had little difficulty in getting off. The sand of which the bed of the river is composed, is coarse and heavier than that of the Indus and Ganges, and at this season is subject comparatively to but little movement.

3rd February. Started at 2 a.m. and ran up the gorge by moonlight to within six miles of Korda by 5 a.m. Afterwards put back to have a better look at the gorge; river in places not more than 600 feet wide. Floods said to rise 60 feet above present level. Banks consist of rock; sometimes in solid masses running out into the river and contracting the channel, sometimes in broken fragments of large size.

During the highest freshes, it is said present steamers on Godavery cannot pass up the gorge, owing to the velocity of current and tremendous eddies; very high freshes last four or five days, and occur three times during the monsoon.

Afterwards proceeded on to Korda, which we reached at 10 a.m. Started again after taking in fuel, and got as far as Marrigoodum by 7 p.m. Distance from Danputnum about 42 miles. Detained by shoals at three places above Korda. The stream above the gorge is generally about 600 feet wide. There are a few detached rocks in the stream, which could be removed at a small expense. They are a source of danger when the river is somewhat higher than at present, as they cannot then be distinctly seen.

In passing mouth of Sibbree River, took discharge of that river roughly, and found it to be 500 cubic feet per second, or 66,660 cubic yards per hour.

4th February. Started at daylight, but detained an hour at shoals. Reached a point two miles above Gollagoodem by 3 p.m., and were then stopped by a very bad shoal. Distance run about 21 miles. The shoals encountered during the day the worst we had yet met with; met with detached rocks which endanger navigation.

5th February. Took discharge of river at Gollagoodem, and found it to be 2,825.6 cubic feet per second, or 376,746 cubic yards per hour.

From 4th to 11th February, engaged in examining works at First Barrier.

12th February. Resumed examination of river—in a row-boat about 28 feet long, eight feet beam, and drawing only 10 inches of water. Started at 7 a.m. from Gongole, and pulled down with stream to the point where our examination in the "Fawn" terminated by 2 p.m. Distance 16 miles. Passed the rocks above Budrachellum, but not without some difficulty; also grounded on two shoals where the "Fawn" was stopped. Met with detached rocks below Budrachellum, some of which should be removed.

The rocks above Budrachellum are very formidable, and in their present condition render the navigation with loaded boats difficult and dangerous. During freshes most of them are submerged and steamers can get up; at the low season small boats can find their way up and down, but it is difficult work; at all immediate stages the river may be said to be practically unnavigable. The rocks are of all heights, and are studded about the river in such a manner as to prevent a fair channel being anywhere formed, at the same time that they permit the stream to find its way through.

From 12th to 16th February, examining works at First Barrier.

17th February. Examination of river resumed from head of First Barrier. Started at noon from Parnasala up stream in a row-boat 28 feet long, eight feet beam, flat bottomed. Draught with load, 15 inches; crew not trained boatmen, but trained coolies. The greatest speed three miles per hour, but could not be kept up. Average speed through water about two miles per hour. Reached Managoor at 6 p.m. Distance nine miles; with exception of ridge of rock about seven miles above Parnasala channel, very favourable. Shoals met with at two places only. The ridge of rocks is almost level and extends completely across the river. The stream was escaping over its whole length, and gave it the appearance of an artificial weir. Boat was unloaded and warped up.

18th February. Started at 6 a.m., and reached Nadthera at 6 p.m. Distance 10 miles. Met with several shoals during the day. Met with rocks eight miles above Managoor.

The stream through them was very strong; when there is more water in the river, there is no difficulty in passing this spot.

19th February.

19th February. Started at 6 a.m., and reached Natlaguntapillee at 7 a.m. Distance 14 miles; met with bad shoals soon after starting; afterwards met with rocks, a few of which should be removed to afford an easier passage to laden boats. At noon came to the Albaka rocks; they extend for about a mile, in which there is a succession of small shoals or rushes of water.

We warped up four of them, and succeeded in rowing the boat up the remainder. There appeared to be about eight feet perpendicular rise in the mile. The rocks are nearly all about the same height, and it would not be difficult to improve the passage through them. Except at the low season, the whole of the rocks submerged, and boats or steamers have no difficulty in passing up or down.

20th February. Started at 6 a.m., and reached Yedithalapillee, three miles below Mungapeth, at 6 p.m. Distance 11 miles; met with three bad shoals, which detained us some time.

The channel is very wide at Mungapeth, below which the worst shoals occur, and the stream, even at this season, is about 120 feet wide.

21st February. Started at 6 a.m., reached Deodcolah at 7 p.m. Distance 12 miles. The navigation was good, with the exception of one shoal, as far as Tyoopettah. At that place there is a remarkable ridge of rock, like a low weir, almost uniform in height, and stretching across the river, which it ponds up to a height of about two feet. We warped through a passage close to left bank. This passage might easily be improved. After passing the natural weir, we were detained by a shoal.

22nd February. Started at 6 a.m. and reached Enchampillee at noon. Distance nine miles. The navigation of the river over this portion is excellent at this season. The channel is narrow and deep, with rocky banks, and the stream is hardly perceptible; but during the flood season the navigation must be attended with considerable risk, and the current must be exceedingly strong between Tarlagoodum and Enchampillee.

The channel is also encumbered with rocks, and is not clear like the "gorge" below the first barrier.

During the day, examined the site of the proposed weir and locks. Rock generally good for foundations.

23rd February. Examined hill, where proposed quarries are to be commenced. At 3 P.M. started up river and got to Nilampillee, where there was a strong rapid; distance two miles. The channel is a mere gap in the rocks the whole way. It is generally about 100 feet wide and very deep.

24th February. Unloaded boat and warped her up rapid; afterwards unloaded boat and pulled up to Sindoor rapid, over which we warped in a few minutes. Arrived at foot of Somnoor Fall at noon; distance $4\frac{1}{2}$ miles. The fall is about 12 feet, and the whole descent takes place on a few yards; unloaded boat preparatory to hauling her over the rocks and relaunching her above falls. Observed, that the Idrawuttee river was contributing only 150 cubic feet per second.

25th February. Examined site originally proposed for upper weir or anicut; the rock extremely hard.

26th February. Started again at 8 a.m., up river, and reached Annipilly by 6 p.m.; distance 10 miles; met with rocks and strong stream at a few places within a mile of the falls; some of the rocks should be removed to afford a clearer passage for boats. At about two miles above the fall the character of the river entirely changes again. The channel is about two miles wide and the bed sandy. We met with shoals, but had no difficulty in getting over them; they were, however, of greater extent than any yet passed over; near Annipilly the river is narrower.

27th February. Started at 6 a.m.; reached a point about five miles below junction of Godavery and Pranheeta at 6 p.m.; distance about 10 miles. Above Annipilly the river widens out to two miles again, and the shoals are extensive. For half an hour, sometimes, we were scraping the bottom. At this season the stream meanders through the bed of sand generally in one, but at one spot in three channels.

28th February. Started at 6 a.m. and reached Sironcha at noon; distance nine miles; navigation excellent the whole way. Noticed that the discharge of the Godavery proper at junction with Pranheeta was only about 300 cubic feet per second.

1st. March. Conferred with Captain Glasfurd, deputy commissioner of Sironcha, on the subject of the navigation works, the road to Chanda, and the condition of the country on both banks of the river. Afterwards started at 2 p.m., and reached Poolagam at 7 p.m.; distance eight miles; navigation excellent, water deep and stream slack. The river here called Pranheeta is narrow compared to the Godavery; average width about three-quarters of a mile.

2nd March. Started at 6 a.m., and reached Oyapillee at 6 p.m.; distance 13 miles; with the exception of a long shoal and strong current near Soopa, the navigation good. At the shoal, the river was running in two streams, one of which might have been closed. River only one quarter of a mile wide in places.

3rd March. Started at 6 a.m., made slow progress on account of shoals till 10 p.m.; river only one quarter of a mile wide; met with other shoals with large stones or rocks in bottom, but were not much detained. Took discharge of river about three miles below confluence of Bibree River, and found it to be 726 cubic feet per second. Afterwards noticed that the Bibree's discharge was only about five cubic feet per second. Stopped for the night near confluence; distance run, 11 miles.

4th March. Started at 6 a.m.; reached a point three miles above Mogullee at 3 p.m.; distance 14 miles; navigation excellent to Dewalmurree. The river only about 800 feet wide from bank to bank. Rock frequently occurs in the banks, and there are some large masses in the river, but there is plenty of room to steer clear of them. Near Dewalmurree met with a succession of shoals and strong current. Found it easier to track with boat than row. Afterwards got better navigation to Mogullee. At that place a shoal with strong current stream running in two channels. Above shoal, got deep water and straight channel with rocks on both sides for three miles, where we were stopped by a mass of rock with a fall of about three feet.

5th March. Left the boat and marched through jungle, parallel to general course of river, to Seepilly, six miles.

6th March. Marched from Seepilly to Kowtaram, 18 miles.

7th March. From Kowtaram to Salagaum, on bank of Wurda; distance eight miles. Found little steamer "May Flower" lying there idle, her machinery out of order. She was brought up the third barrier years ago; but cannot, without the greatest danger, be taken down again. In the evening examined site for proposed weir at crest of third barrier. The rock is hard and very good for a foundation. The weir would altogether be about 2,000 feet in length. Informed that there was a shoal four miles above the barrier, which at this time of the year would stop a boat.

8th March. To Gunpoor, 17 miles.

9th March. To Dhylee on bank of Wurda; distance 12 miles. The country here more open, and cultivated. Examined the Wurda in the evening. The channel well defined with steep banks, and 500 feet wide. Bed sandy; banks clay; stream running in two small channels; united discharge 133 cubic feet per second. Depth of water at head of stream, where there is a ford, one foot.

10th March. To Chanda, a large town formerly; when under native rule a place of great importance, and fortified with extensive masonry walls. Examined the Wurda at Bularpoor; channel well defined with steep banks, 500 feet apart. Rock running out into the river from left bank, but not stretching across bed. Met Lieutenant Sartorius, assistant deputy commissioner, who gave us much information about the place.

11th March. Chanda.

12th March. Conferred with Major Lucie Smith, deputy commissioner of the district, on subject of the navigation works and road from Chanda past the third barrier; also on the cotton trade and resources of the district. Major Smith showed us some of the coal found in the bed of the Wurda and other places, extending over a space of about 25 miles, in the vicinity of Chanda.

APPENDIX (B.)

MEMORANDUM on Storing Water to increase the Natural Stream on the Godavery during the Dry Season, and to extend the Navigation up the Wyne Gunga.

MAJOR HAIG, in a supplementary part of his report, dated 3rd May 1856, paragraph 262, mentions that to maintain a sufficient depth of water on shoals in the Godavery for vessels of three feet draught, the quantity of water required is 1,928,400,000 cubic yards. Major Haig, however, admits that his observations on the river are insufficient to allow of his being quite satisfied of the correctness of this, and from his description of the shoal on which the calculations were based, and from what Colonel Anderson and myself noted in passing up the river, I much fear that the quantity of water required was greatly underestimated. The section of the stream on which the calculations were made was in fact so deep, four feet, that we should not have called it a shoal at all.

2. In a subsequent report, dated 3rd February 1862, nearly six years later, Major Haig writes as follows, extract, paragraph 39:—"Much more careful and detailed measurements of the river will be necessary, before we can be in a position to form reliable estimates of the quantity of water required to maintain given depths in the navigable channel." Major Haig, afterwards, in paragraphs 50 and 51, goes on to show what quantity of water would have to be added to the river's natural supply, to maintain the stream in a channel of assumed dimensions five feet deep. The result of the calculation is 4,089,200,000 cubic yards, or a little more than double the result first arrived at.

3. I have been unable to find in the records any facts to support or upset either of the calculations,

calculations, except in one instance, where, in a report, No. 467, dated 22nd October 1863, paragraph 11, on the second barrier works, the following passage occurs:—"But I was not aware then of the great defects of the open part of the bed immediately above that point (top of the second barrier), defects which subsequent observation has shown it to be most desirable to remove." Major Haig adds that the river in this part "is impassable as early as the 1st of October." Now, it is known that, in that month, the stream in the river is far in excess of the quantity which Major Haig's highest estimate even gives as necessary, and if there should be other shoals as bad or even half as bad, it is clear that the reservoir system is not so applicable as was supposed, or if the bad spots are very few, that some modification of the works now under consideration by Government should be made.

4. It is not my wish to point out inconsistencies in Major Haig's reports. The calculations he gives are, as he tells us, merely approximations, and we should not be surprised at the varying results. What I am anxious to bring prominently forward, is the serious want of *certain* information, as to the depth of water on the shoals when the river is not flooded by the monsoon rains; and on this point, which vitally affects the success of the whole scheme for rendering the river navigable, I cannot help expressing surprise that with such a large establishment of steamers and boats on the river, so little should have been ascertained and recorded during the 10 years which have elapsed since the regular investigation of the navigation project was commenced.

5. I would suggest that no further time be lost in obtaining the necessary information. It is absolutely necessary to enable a fair opinion to be formed of the applicability of the reservoir system to this river, and I believe it to be most desirable also, in connection with the works now under consideration by Government. I may mention that the result might lead to a material modification of the second barrier works. A very bad part of the river was noticed during our late examination, several miles above the spot mentioned by Major Haig as "impassable" during October, and should that part be also impassable or even defective, while much of the river is in a good condition, it would be very desirable, in my opinion, to place the anicut or weir at the *upper* end of the barrier, where there is an admirable site for it, quite free from the constructive difficulty which occurs on the site at the lower end of the barrier, and to carry a canal thence to below Enchampilly, where the navigation is safe at all seasons. A high anicut at the upper end of the barrier would improve the navigation above it, for a very long distance, and the canal to below Enchampilly would enable boats to pass this most dangerous part of the river (a contracted rocky channel with a rapid current), with perfect ease and safety during the monsoon, or whenever there might happen to be a strong stream running.

6. The result of such an examination of the shoals might even lead to greater modifications, and to change in the ultimate treatment of the river. It might show that the reservoir system is quite inapplicable, and that in place of cutting passages through the rocky ridges or reefs above Parnasala and at Albaka, we should construct weirs upon them, and obtain slack water navigation over defective parts of the river. Such works would doubtless cost more than the mere rock clearances; but their value would be great, and possibly they may prove actually indispensable to the proper success of the Godavery navigation. In such a river, which has already a considerable stream flowing, the effect of weirs would extend far beyond the mere level pond which is formed immediately above them. The bed of the river above each weir would be raised, its slope reduced, and the stream retarded. The depth of water would be increased, and this, without the drawback of the increased velocity of current, which is unavoidable with the reservoir system.

7. It will be time enough to consider the respective merits of the slack water and reservoir systems, as applied to the Godavery, when the information now so much needed is supplied; but there are some points of detail on which I differ from Major Haig and some which I concur with him; and I think it right to briefly mention them.

1st. The velocity of the stream.—Major Haig assumes that this will be proportional to the depth when the volume is increased, and I should concur with him, if the shoals were continuous and the depth of water uniform; but they are not so in reality. The stream runs with a varying velocity, as the water deepens or shoals. It does not, in a natural channel, attain its full accelerated velocity, without again and again losing head or "charge," as it is sometimes called. The stream is continually starting down shoals and pausing in the deep spots. But directly the volume of water is increased, the want of uniformity in depth is diminished, and there is less variation in the velocity of current, which retains its full acceleration without such repeated losses of head. The effect is, that instead of starting from almost a state of rest at the commencement of a shoal, it approaches the spot with a high velocity, and glides rapidly over. In practice, the result will be, that the water, when increased in volume, will flow with greatly increased rapidity over shoals without much increasing the depth.

2nd. The cause of the shoals above second barrier and their treatment.—Major Haig considers that the width of the river causes these shoals, and I so far concur that I think the great width of the river is one of the causes. But there is another cause, and I think a greater one, in the extraordinary manner in which the contracted deep channel of the second barrier, acts upon the river above. During floods, the

barrier holds up the water to a great height, and thus slackens the stream, and causes the deposit of sand for a long distance up stream. But when the floods subside, the deep channel at the barrier draws the water rapidly off the comparatively shallow portion of them above, and leaves the navigation defective. The effect is not merely local, though it would be so at first, supposing such a phenomenon as an obstruction like the second barrier, to be suddenly produced. In the course of time the merely local sand bank produces another above it, and the process continues till there is a vast accumulation. Major Haig proposes groins for contracting the width of the river at the wide part; but I question whether this is an economical or satisfactory mode of dealing with the difficulty. If the river is contracted so as to deepen it, the reach above the shoal may suffer seriously. The stream, when the river is low, is not by any means wide at the shoals; it runs in a low level channel of moderate width, but has a great slope and velocity, and the best mode of dealing with this part of the river, in my opinion, is to raise a very high weir at the head of the barrier, and thus prevent the escape of the water at a low level during the dry season. Major Haig would appear, from what he says of the second barrier works, to have been inclined to this view also; but he has since recommended a weir at the lower end of the barrier only, the effect of which on the wide part of the river above, will be very slight. At the upper end of the barrier the rock is remarkably hard, and there would be no difficulty in making the weir 30 feet or more in height above summer level. The top of the weir might be on about the same level as the bed of the river 20 miles further up, and its beneficial influence would extend for a distance of perhaps 40 or 50 miles up both the Pranheeta and the Godavery proper.

Third.—The loss of water by absorption in the river bed.—I quite concur with what Major Haig has advanced upon this point. It agrees with all I have noticed of rivers in the Dekhan, whose stream is constantly increased by springs in the bed. In the rivers of upper India, whose beds are everywhere of pure sand of unknown depth, and where the substratum of the country on both banks partakes of the same character, the stream during the dry season has actually been found to diminish after the steep slopes and shingle at the base of the hills are left behind; but those cases are not analogous to those of rivers in a totally different formation, and when, as far as can be ascertained, the substratum consists of rock. The frequency with which rock occurs in the Godavery, and the manner in which the stream during the dry season is augmented as it flows onwards, leave no doubts on my mind as to the correctness of Major Haig's conclusion.

Fourth.—The sufficiency of the water which must be added to the Godavery, to render the tributary down which it will pass navigable. This cannot be conclusively settled till surveys have been made; but I am inclined to agree with Major Haig.

Fifth.—The comparative cost of the slack water and reservoir systems.—This cannot be properly determined without a survey and most complete information; but in Major Haig's sketch of the cost of the two plans in his report dated 3rd February 1862, I think the estimate is evidently much too high for the slack water, if that for the reservoir system is fair: I observe that the cost of the dams for the slack water is estimated as they all had to be built on sand, but there are rocky sites which may be taken advantage of to very greatly reduce the cost. Again, in fixing the number of these works it is assumed that the water will stand nearly level from one dam to another; but this cannot be the case. The natural stream of the Godavery, impeded as it would be by a series of dams, would itself afford a sufficient water section to float the boats, and the dams might be placed at much greater intervals than Major Haig allows. The loss by absorption of water which is urged against the system, is, I think, no more applicable to this than to the reservoir system. In the case of dams at intervals, the absorption of the water would take place most when the river is in flood, and there seems to be no reason why the water should not be set free again, and return to the river in the shape of springs during the dry weather, especially immediately below each dam. Indeed, it seems almost certain that the construction of a number of dams at intervals, would actually increase the river's stream during the dry season, as they would retard and raise the water when in excess of the minimum supply and charge the springs. There are very large sums, 10 and 31½ lakhs, allowed in the approximate estimates of the slack water and reservoir system for training walls, the necessity of which I do not perceive. These works appear to be quite distinct from the groins and rock clearances provided in this and other sketch estimates; so large an expenditure as 31½ lakhs for training walls in connection with the reservoir system, would, I fear, if found indispensable, condemn the system, at least as far as the Godavery is concerned.

8. I have alluded to these points, because it is very necessary that they should be carefully considered when an endeavour is made to obtain more information respecting the river.

9. It is possible that the great variety of circumstances under which the river finds its way down the valley, may lead to the adoption of a system which is neither exclusively that of slack water nor of reservoirs, but a combination of the two. The impression left on my mind, however, is very much in favour of the reservoirs which Major Haig

so strongly advocates. Major Haig may have been much too sanguine at first and may still be so, but as his aim is to obtain five feet depth of water on shoals, while even four feet would in my opinion afford admirable navigation, if it can be obtained without a great acceleration of the velocity of stream, it may be found that the reservoir system is still really the best. Major Haig has mentioned that a body of water sufficient to make the main river navigable, will make the tributary down which it flows, also navigable; and if this should prove to be the case, it will tell greatly in favour of the system. He has also explained that the most expensive period of the year to maintain the navigation is in May and part of June, and that if for a short period at that time of the year the navigation is closed, the quantity of water to be stored will be reduced by about one-half. This is most important, because it would allow of a gradual extension of the reservoir system, the financial advantage of which is evident.

10. Altogether, I think the system a most promising one, and I should deeply regret if Captain Haig's views did not receive the attention, it appears to me, they deserve. The value of the navigation may possibly be enhanced threefold by a moderate outlay on reservoirs. I will now proceed to speak of the Wyne Gunga, on two of the tributaries of which, the Kunhan and the Pench, most promising sites for large reservoirs have been discovered.

11. Major Haig, from the first, regarded the navigation of the Wyne Gunga, along with other branches of the Godavery, as most important; but my attention was more particularly drawn to the Wyne Gunga, by a remark made by the Chief Commissioner, in a report dated 23rd January 1863, on the Godavery and its feeders. In describing the different branches of the river and noticing the unnavigability of the Wyne Gunga, in its natural condition, Mr. Temple remarks, "this is a very unfortunate circumstance," and the statistical information given in other parts of the report, indicate why it is so unfortunate. The valley of the Wyne Gunga is fertile and populous, and it is almost destitute of means of communication with the coast to the eastwards; while to the westward it does not possess the same advantage as the Wurda Valley in proximity to the railway. Under the circumstances, I cannot but regard the opening of the Wyne Gunga, as of greater importance than that of the Wurda, now that the railway already passes through the valley of the latter, and that its opening is necessary for the proper development of the Godavery navigation.

12. From a memorandum forwarded by Mr. de Grousilliers, who examined the Wyne Gunga in October 1861, it appears that the channel is rocky for the first 76 miles above its junction with the Third Barrier on the Pranheeta, and that there are several rapids or falls, whose total descent is about 60 feet. From the 76th mile to the 145th, beyond which the examination does not appear to have extended, the channel is clear. Again, from a report on the Kunhan Reservoir by Mr. Hanna, Executive Engineer for Irrigation, it appears that the difference of level between the Kunhan, a branch of the Wyne Gunga near Kamptee, and the point where the Wyne Gunga enters the Third Barrier, is about 438 feet, the distance measured along the course of the rivers being 200 miles. The average fall per mile is thus 2.19 feet. But the slope of the Kunhan in the vicinity of Kamptee is 3.6 feet per mile, and from this it would appear that the slope, as is commonly the case, is not uniform, but is steeper in the upper part of the channel. The average fall of the Wyne Gunga itself is therefore probably very much less than 2.19 feet per mile. Further, from the longitudinal section of the Third Barrier, it appears that the point where the Wyne Gunga joins, is 28 feet below the top of the barrier, and at a distance of eight miles.

13. Now, if a weir of about 28 feet in height or rather more, were constructed across the barrier at the point where the Wyne Gunga enters it, and if the canal already under consideration for the Third Barrier, were carried thence to Moglee, the foot of the Third Barrier, we should secure the following important advantages:—

1st. The connection of the Wyne Gunga and Wurda navigation.

2nd. The shortening of the proposed Third Barrier canal, by about eight miles, and a reduction in the lockage.

3rd. The overcoming of probably 20 out of the 60 feet perpendicular measurement of falls and rapids in the lower part of the Wyne Gunga.

14. It is of course impossible, without a survey, to state how many weirs would be necessary to overcome the remaining falls and rapids on the Wyne Gunga; but as the river drains about the same area on the Wurda, and has apparently at least as great a slope of bed, the channel will probably be of the same moderate dimensions, and as the bed is of course rock where the falls occur, the construction of the weirs need not be a difficult or expensive matter. Experience in the Dekhan has shown that where the foundation is rock, weirs may be constructed of the roughest rubble, provided good mortar is used, and at rates which do not materially differ from those for ordinary walling, expensive work is unnecessary. There is also great latitude for the height of such works. The quantity of material required is not large, and where the rock may not promise to be hard enough to bear the direct action of the overfall, it is generally easy to meet the

difficulty, by constructing a subsidiary weir immediately below the main one, and thus form a cushion of water between them for the overfall.

15. It is true that the placing of a weir at the confluence of the Wyne Gunga would not benefit the Wurda so much as if it were placed at the summit of the barrier, eight miles higher up; but the Wurda's bed is so flat immediately above the barrier, that the effect of a weir placed on the lower site will extend a long way, and beyond this limit a suitable site for another weir, where the Wurda is comparatively narrow, may be found. These remarks of course apply to the slackwater system on the Wurda. If a site for a reservoir can be found up its valley, the weir at the foot of the Wyne Gunga would answer for both rivers.

16. For the extension of the navigation up the Wyne Gunga, I will now refer to the surveys which have been carried out under the direction of the Chief Commissioner, for storage reservoirs.

17. From Mr. Hanna's report, dated 6th July 1863, on the Kunhan project, it appears that the contents of the reservoir, up to the 110 feet level is 100,000,000,000 cubic feet, and that allowing

- - - - - 12,000,000,000 „

for evaporation, there will still be - - - - - = 88,000,000,000 „

or 3,260,000,000 cubic yards available.

The deduction for evaporation is unnecessarily large, but till accurate plans are made, it will suffice to take the figures as they are given.

18. The gorge to be closed is 6,000 feet wide, and greatest height of dam in centre, 120 feet. The subject of the waste weir is not alluded to by Mr. Hanna; but from what he says of the rock cutting necessary to liberate the water for distribution, it is concluded that facilities exist for turning the water over a rocky saddle. The area occupied by the reservoir, or lake as it might properly be termed, is 500,000 acres, and in this space there are about 100 villages, containing 50 houses each, and occupied by about 10,000 people.

19. From these data and rates, which have been deduced from works in the Dekhan, I have drawn out the following approximate estimate:—

	Rs.	Rs.
Earthwork in Dam - - 6,000 × 80 × 170 × 2		
	100	= 12,24,000
Pitching slope of ditto - - 6,000 × 200 × 3 × 8		
	100	= 2,88,000
Waste weir, supposing circumstances favourable -		1,00,000
Regulating Arrangements:		
Rock cutting - - - - -		1,50,000
Masonry - - - - -		50,000
Valves - - - - -		20,000
		18,32,000
Add, 20 per cent. for establishment and contingencies		3,66,400
Total for Works - -		21,98,400
Add, compensation for Land and Houses:		
For land, 2,50,000 acres (supposing one-half of whole area destroyed), at one rupee annual rent and 20 years' purchase - - 5,00,000		
100 villages containing 50 houses, each at 160 rupees for each house - - - 8,00,000		
		13,00,000
		34,98,400
Supposing that an earthwork dam is not considered sufficient, and that masonry must be used, the addition would be - - - - -		6,00,000
Making altogether - -		40,98,400
Or, say, 41 lakhs =		41,00,000

20. The quantity of water available, after deducting for evaporation is 3,260,000,000 cubic yards. The rate is thus 800 cubic yards nearly per rupee. The general rate which Major Haig allows for storing, is 1,000 cubic yards per rupee, and as the calculations are given

given above are approximate merely, and differ by one-fifth only from that rate, the result as far as can be seen at present, bears out what Major Haig has advanced.

21. I will now endeavour to estimate the cost of storing water on the "Pench" river. A Minute, dated 2nd July 1864, by the Chief Commissioner, clearly describes the nature of this project, and it is unnecessary for me to do more than extract the dimensions, and arrange the items of the estimate in the same manner as in the preceding case.

22. The area of the lake will be about 30 square miles, and the ground is at present occupied by a vast forest of ordinary jungle trees, which are of small value. There are only four villages which will be submerged. The contents of the lake up to the 120 feet contour, are estimated—

At - - -	44,817,600,000 cubic feet,
Or - - -	1,548,800,000 cubic yards,
Deducting -	111,100,000 cubic yards for evaporation; there
Remain -	1,457,700,000 cubic yards available.

The loss by evaporation has been taken at eight feet perpendicular, as in the former case; as already mentioned, the allowance is unnecessarily large, still the loss bears but a small proportion to the contents of the lakes, and alterations therefore will not materially affect the result.

23. The gorge to be closed is 2,500 feet wide, and the dam will be 130 feet high in the centre. The river bed is rocky, and it is concluded that facilities exist for the waste weir.

24. From these data, I have prepared the following approximate Estimate:—

	Rs.	Rs.
Earthwork in dam - - - $\frac{182 \times 65 \times 2,500 \times 2\frac{1}{2}}{100}$ =		665,437
Pitching slope of ditto - - - $\frac{210 \times 3 \times 2,500 \times 8}{100}$ =		1,26,000
Waste weir - - - - -		1,00,000
Regulating arrangements - - - - -		1,20,000
Total - - - - -	Rs.	10,11,437
Add 20 per cent. for establishment and contingencies - - - - -		2,02,287
Total for Works - - -	Rs.	12,13,724
Add Compensation for Houses and Land:		
For four villages say - - - - -		35,000
For lands of ditto - - - - -		35,000
Grand TOTAL - - -	Rs.	12,83,724
Supposing, as in the former case, that an earthen dam be considered insufficient, and that masonry should be used also, there would be an addition of about - - - - -		3,00,000
Making altogether - - -	Rs.	15,83,724

Or say, 16 lakhs of rupees.

25. The amount set down in Mr. Temple's Minute as the approximate cost is 13 lakhs. The excess over this in the estimate I have given is due to extra masonry work in the dam; deducting this, the totals would correspond, though the details differ.

26. The quantity of water available, after deducting loss by evaporation, is 4,57,700,000 cubic yards. The rate for storing, therefore, is 900 cubic yards per rupee, which pretty closely agrees with Major Haig's rate.

27. The facilities for storing water are very remarkable in both the Kunhan and Pench projects; compared to one of the best tank sites we have been able to discover in the Dekkan part of the Bombay Presidency, I find that the Kunhan reservoir has advantages.

tages in proportion of nearly 7 to 1—the rate for storing water in the Dekkan being 114 cubic yards only per rupee.

28. If the rate obtained from the Kunhan reservoir be taken, 800 cubic yards per rupee, the cost of storing 2,000,000,000 cubic yards, the quantity Major Haig mentions as necessary in his latest report for 10 months navigation, would be 25,00,000 rupees.

Now, if for this outlay, and some moderate addition for weir and locks to ascend the falls and rapids on the Wyne Gunga, an addition of 200 miles of navigation up the valley of that river can be obtained, and at the same time the Godavery itself can be rendered navigable for vessels drawing $3\frac{1}{2}$ feet of water for 10 months in the year, the gain would evidently be immense, and it may be possible even to obtain these desirable ends at even a less cost, as Captain Haig speaks of preserving a depth of five feet, which is more than is necessary.

29. It is quite unnecessary for me to add more respecting the advantages of such an extension and improvement of the navigation, as they are already so well known by the Chief Commissioner; I will therefore now conclude by sketching out the arrangements which seem to me best suited for collecting the requisite information, to enable a correct view to be formed of the feasibility or otherwise of improving and extending the navigation by means of the reservoir system.

30. I would suggest that Mr. Hanna be requested to prepare regular plans and estimates of the Kunhan and Pench reservoirs, and also that he should make a general examination of other tributaries of the Wyne Gunga and of the Wurda, to ascertain whether still better spots cannot be found for reservoirs.

31. I would further suggest, that an officer of the Godavery establishment be deputed to survey the Wyne Gunga at the conclusion of the present monsoon. The survey to consist of a line of levels down the river, properly checked by connection with Mr. Hanna's levels and cross sections, where it may appear necessary to construct weirs, to overcome the falls and rapids.

32. Finally, I would recommend that opportunity should be taken during the present monsoon to get the "Fawn" or some other small steamer of very light draught over the second barrier; and that similar small steamers should be stationed between the first and second barriers, and between the Gorge and the first barrier; instructions being issued to the Transport Department to run the steamers up and down at short intervals, and ascertain carefully the depth of water on the shoals from September, when the monsoon floods begin to subside; and to take cross sections and ascertain the discharge of the river by observed velocities, in the usual manner whenever bad shoals occur. I have suggested the employment of the small steamers for this purpose, as they afford good accommodation and shelter, but if they cannot be made available for the purpose, the examination may be conducted in the "accommodation boats." For a similar examination of the Wurda and Wyne Gunga, I would recommend that Mr. Thompson of the Transport Department, who has a sound practical knowledge of navigation, should be employed. He should be furnished with two light boats, one for the Wurda, and one for the Wyne Gunga, and should watch his opportunity whenever there may be a break in the monsoon to pass down each river (the Wurda from near the junction of the Wunna, and the Wyne Gunga from Kampta, about 50 miles above junction of Kunhan), and note carefully the depth of water on all shoals, take cross sections, by measuring the depth at intervals, and ascertain the velocity of the current. In taking sections and the velocity of current, he should receive instructions from the executive engineer at Doomagoodiem, and he should be furnished with a watch with a second hand; a half seconds pendulum, which could be made up in the workshops, would also be useful to him in case of accident to the watch. Mr. Thompson should make some marks on the river bank or bed when he takes his sections, and note them carefully in his log book, that they may be identified after the monsoon, when the instrumental survey of the river is made. Mr. Thompson, if possible, should time his journeys down the rivers, so as to see them when the discharge is not more than 500,000 cubic yards per hour in the Wurda, and 1,000,000 in the Wyne Gunga. He will probably be able to make two trips down each during the monsoon. One other examination after the monsoon is over would suffice. In the logs kept on board the steamers or boats all points affecting the navigation of the channels should be entered, such as whether they are intricate or easy to get through, and what length of boat they will answer for; whether clear of rocks or not; whether there is more than one channel and small islands or sand banks, or whether there is only one stream. The general velocity of the current should also be noted. The lead should be kept constantly going, and all soundings under 12 feet carefully recorded, with the date and locality. Gauges should at once be fixed at Golagoodiem below first barrier; at Mungapett between first and second barriers; at Sironcha between second and third barriers; at Ballarpoor near Chanda on the Wurda; and immediately below the junction of the Kunhan on the Wyne Gunga. All the gauges should be registered, morning and evening from the time they are put up till the conclusion of the survey. For the purpose in view the gauges are required in the open portions of the rivers, and not near barriers.

33. The information such an examination and survey of the Godavery will afford would be invaluable. At present there is too little known of the shoals, and it is impos-
sible

sible to state with any certainty what sized boats could navigate the river at the conclusion of the monsoon. The passage backwards and forwards of steamers between Doulaishwaram and Golagoodiem, the lower end of the first proposed long canal at the first barrier, is no criterion whatever of the state of the navigation above. Between those two places the river has advantages. The great anicut or weir at Doulaishwaram benefits the lower portion, and the upper is all of moderate width, while the volume of water is greater than it is anywhere above. When Colonel Anderson and myself passed up the river at the beginning of February last, we found we could not get the "Fawn," drawing 18 inches only, more than about two miles above Golagoodiem. There were shoals then which had less than one foot of water on them, and we actually grounded twice a few days after, when passing down in a row boat drawing 10 inches only. I can only say that I trust the survey will show that bad shoals are exceptional, and that on the whole the navigation is good.

Mussoorie,
27 June 1866.

(signed) *J. G. Fife*, Lieutenant Colonel,
Royal Engineers.

The above Memorandum is signed by Colonel Fife alone, partly because the Government of India have expressed their intention of limiting the Godavery project for the present to the opening out of the river, in the partial manner which can be effected by means of its natural supply, without the aid of storage works; and partly because the information available is far too vague in my opinion to allow of any reliable estimate being formed of the cost of such works.

I therefore forbear to enter upon the subject at all. I will merely remark that as the cost of the works already sanctioned is proving so much greater than the Government of India anticipated, and as moreover the outlay still required to complete them is a matter of uncertainty, it appears to me in the highest degree inexpedient that the Government should be committed to the construction of any works which cannot be shown to be indispensable for effecting the object which they have expressed themselves desirous of obtaining, and that only.

The only point which we have brought forward in the body of the report which does not come within the specific instructions we have received, relates to the mode of dealing with the third barrier. As the Chief Commissioner's preference of a road round it, to a canal, is based mainly on the uncertainty of the cost of the latter work, we have ventured to suggest that the approximate cost should, if possible, be ascertained before this portion of Major Haig's scheme be definitely abandoned. The reason for our recommending a canal, instead of a road, are given in the body of the report. But even should Government order the preparation of an estimate for a canal, and for the additional works required to carry the navigation as far as Chanda, and should it be on so moderate a scale as *apparently* to justify the expenditure, I would still advocate the entire completion of the works at the first and second barriers, and the clearance of rocks at other parts of the river before the third barrier canal is commenced.

When the navigation is once open as far as Sironcha, and the passage of boats up and down the river between that place and Doulaishwaram becomes an established fact, the Government will then be able to calculate with some degree of certainty what improvement of traffic may be expected from continuing the navigation to Chanda. Hereafter, good reasons may be brought forward for extending and improving the navigation still further; but such reasons must be based on the results of the works which shall have actually been carried out.

The calculations of returns from the irrigation works that were proposed in the Godavery and Kistna Deltas, were, in the first instance, hypothetical, and the Government had not much confidence in them. An anicut and several channels were, however, sanctioned and carried out, and a large increase of revenue made a matter of fact. Government has thus the opportunity of feeling their ground at every stage of further proceedings, and every additional work which was sanctioned, and which still further improved the revenue, served to engender a confidence which nothing can now shake.

The Upper Godavery may be treated in the same way. If the works within the limits above recommended yield satisfactory results, the Government will have facts to guide them to a conclusion, as to the merits of any extension which may afterwards be recommended. If the results are unsatisfactory, they will not have been committed to a larger expenditure than was necessary, in a laudable attempt to develop the resources of a large tract of country.

(signed) *J. C. Anderson*, Lieutenant Colonel,
Roorkee, Royal Engineers.
27 June 1866.

Enclosure 3, in No. 17.

MINUTE on Colonels ANDERSON and FIFE'S REPORT on the GODAVERY NAVIGATION PROJECT, by *R. Temple, Esq.*, Chief Commissioner of the Central Provinces.

By the letter (No. 1221 c.) of the Government of India in the Department Public Works, of the 14th December 1865, I was informed that Colonels Anderson and Fife would be deputed to examine and report on the Godavery project. After consulting with them, I was directed to submit their Report, together with my own observations, to the Government of India.

2. I had an opportunity of conferring with these officers in March last, after their visit to the Godavery. But their Report was delayed by reason of their having been intermediately deputed to other duty, and it did not reach me till the 5th September; it was then in manuscript, and has had to be printed, together with this Minute. This will account for some slight further delay in the submission of the papers.

3. I now proceed to record my observations on their Report herewith transmitted, following the order of topics as brought forward by them.

4. Colonels Anderson and Fife preface their Report by a summary of their conclusions, which are replies to the main questions put by the Government of India. To each of these I will advert very briefly.

5. Conclusion 1 is that "rejecting the portion of the longer line of canal at the first barrier, the works executed for the minor project are sound and good, and likely to stand."

To this I have no observation to make, save that I do not altogether concur in rejecting the portion of the longer line of canal, for reasons which will be stated further on.

6. Conclusion 2 is that while the greatest zeal has been shown by Major Haig and his officers, "the past management of the works has not been successful or economical."

Hereon I would observe that the question put by the Government of India was whether the management had been successful and economical, "considering the difficulties involved in the undertaking." The above conclusion thus seems hardly to meet the latter clause of the question. Viewing the whole thing in the abstract, I should admit that the operations have hardly as yet been successful, and certainly not economical. But, "considering the difficulties involved in the undertaking," the Report goes to show that the works have been very fairly successful; and that though there has been a great and not altogether remunerative expenditure, yet there has been no disregard of economy on the part of the officers engaged.

7. As regards the management of the works, the first conclusion, as already seen, declares the works executed at the first barrier to be good. Further on, the fifth conclusion states that the "works designed at the second barrier will answer the purpose intended." In a subsequent portion of the Report, para. 97, it is remarked, in reference to the anicut, the largest of the works, that it "cannot fail to be durable and inexpensive to maintain. The cement which is used on this and the other masonry works is of the most excellent quality, far superior to the mortar generally used in the other parts of India." Again, in regard to the second barrier design, it is observed, para. 108, that the "hydraulic cement prepared for the Upper Godavery works is of so excellent a quality that a concrete foundation of the kind we have described would be superior to any rubble masonry that could be built."

8. As regards the economy or otherwise in the management of the works, it is shown in para. 94 of the Report that the work at the first barrier costs three and a half times as much as similar work in the Delta districts. But the para. 95 runs thus,—“We are far from attributing these heavy charges to a want of economical management on the part of the officers. We believe that in Major Haig and the executive officers generally, the Upper Godavery has been fortunate in having a more than usually efficient engineering staff, and that the high cost of the works is the natural consequence of the very unfavourable conditions under which they have been prosecuted.”

Then there follows an account of those conditions, and para. 96 runs thus:—

“These causes are quite sufficient to account for the expensive style of the work.”

9. In para. 87, indeed it is pronounced that “the tramways, on which there has been an outlay, in all of about 4½ lakhs, are in the main unprofitable works.” But in para. 76, it is said Major Haig is not responsible for the expense on the tramways.”

It is explained that these works were ordered by the Madras Government to meet an expected emergency, which did not actually occur, and were afterwards given up. They have been indeed useful in other ways, but not to an extent commensurate with the cost. Again, it is shown in many parts of Section 5 of the Report that there has been much expenditure on explorations and other preliminaries. But though this does indeed swell the total outlay, yet it cannot be set down to any want of economy. In para. 121, it is noted

noted that plant and establishment are excessive for the actual work. In support of this (para. 124) there is said to have been too much machinery ordered from England, and the greater use of bullock power is recommended. This may be true; but the question is probably a moot one; and there may be doubts as to cattle power being obtainable in the manner suggested. Again, where the establishment is said to be excessive (para. 127), a revised establishment is proposed in para. 129, which gives a saving on the present establishment of one assistant engineer, and one superintendent of transport. These reductions may be feasible, but still they are not considerable enough to show that the old establishment was excessively large. In para. 125 indeed it is shown that "tramways were laid to two quarries, which proved to be useless, the stone being too soft." This must have involved a loss of perhaps half a lakh of rupees: and this is the only tangible instance I can find throughout the Report of any real failure in respect of economy. But then in the same paragraph it is justly observed that "in so wild a country the engineer has a serious difficulty to contend with in not possessing reliable information."

10. In para. 75 indeed it is remarked that "if the minor project for the first barrier is to be considered final, it is much to be regretted that it was not submitted earlier;" for then much time, money, and trouble would have been saved. This remark, however just in itself, would not show any want of economy; for it really involves the question in respect to the relative merits of the major and the minor projects. First, Major Haig proposed a full and complete project, the execution of which he commenced. Afterwards, with a view to diminishing the immediate outlay, he proposed a lesser project, as a temporary measure only, while adhering to the superiority of the first project. Colonels Anderson and Fife now proposed to substitute altogether the minor project for the major. In this, however, as will be seen hereafter, they embrace questions of some difficulty, in respect to which some may differ (as I for one do differ) from the conclusions they arrive at. Thus the circumstance that Major Haig did not, in the first instance, propose and commence with the minor project, cannot be set down to any want of economy or management.

11. These observations are offered to elucidate rather than to controvert the dictum of Conclusion 2. I have recorded them in justice to the officers employed on the Upper Godavery, who seem still to be worthy of all the confidence heretofore reposed in them by the Government of India.

12. Conclusion 3 is to the effect that works such as those now in progress or designed will afford navigation by steamers for four or five months in the year, and by boats during eight or nine months.

Hereon I have to observe that these anticipations are more favourable than any which I ventured to put forth in my Report of January 1863. In that Report the expectations did not exceed a period of five months in the year (*vide* paras. 118 and 122). But now Colonels Anderson and Fife themselves managed to get up the river over the greater part of the way to the third barrier by steamer or boats, a distance of 125 miles by steamer, and 190 miles by boats, in the midst of the dry season. This naturally impressed them with the capabilities of the stream for navigation. Also since submitting my report in 1863, I have examined the Mahanuddy. I have seen country boats toiling up and down amidst shoals and sandbanks and rapids in a manner which would hardly be deemed possible by any, save those who had seen it. On the whole, I should be prepared to accept this conclusion, which is fully unfolded in Section 3 of the Report on the "Probable Traffic by Country Boats," with the reservation that too much must not be expected of these boats in the dry season, and that Colonels Anderson and Fife themselves note that during a portion of the eight or nine months only boats of very light draught will be able to ply. I have only to observe, in addition, how satisfactory it is to find that officers of such experience and ability as Colonels Anderson and Fife entertain such hopes of the river, surpassing those formed by this Administration in 1863, when recommending the execution of the project now in progress.

13. Conclusion 4 is divided into two parts. The first part is thus put: "As regards the works at the first barrier, looking at the requirements of navigation for four or five months only, the anicut might have been dispensed with; but that in order to allow of boat traffic being carried on for several months longer its construction was necessary."

The above dictum is not so specific as to make me feel sure that I rightly apprehend it. And the subsequent Section 5 of the Report (paras. 90, 97, and 98) does not seem to throw any light on the meaning. If the original or major project of the barrier be undertaken with a long canal, then the anicut is admitted to be necessary. If the new, or minor project only (as now recommended by Colonels Anderson and Fife) be undertaken with a short canal, still there must be an anicut. No canal from such a river as this can be led off, apparently, without either an anicut or else some sort of head work equally costly. If, again, it be meant that for a four or five months navigation no canal need have been allowed, and that it would have sufficed to blast the rocks here and there, then I should decidedly consider that such navigation would not be safe nor continuous. It might be practicable during freshes; I myself went down on such an occasion, but was unable a few days afterwards to come back in the same manner; but there would be dangers to vessels on any temporary subsidence of the water. Again, without an anicut

how could the bad rocks alluded to in the report be submerged so as to always let vessels pass over them?

So far, then, as I understand this part of the conclusion, I should be obliged to dissent from it.

14. The remaining part of the conclusion conveys a general approval of the designs and estimates for the second barrier, as now submitted for approval of the Government of India. Hereon no remark seems necessary, save that it is very satisfactory to find this to be the opinion of such competent authorities as Colonels Anderson and Fife.

15. Conclusion 5 begins thus:—

“Before the communication can be pronounced effective, the line of navigation should be carried on as far as Chanda.”

This point is further discussed in paras. 8 to 19, inclusive, of the report. It involves, of course, the execution of large works at the third barrier, and also certain other works intermediate between that barrier and Chanda. Recently, also, a Despatch from the Secretary of State has been transmitted to me by the Government of India, whereby the prosecution of operations at that barrier appears to be decided on. The above part of the conclusion does not demand any lengthened comment. But I must observe that it either goes too far or else not far enough. For though the probable maximum cost of works at the third barrier, and thence up to Chanda, is not at all known (in the absence of designs and estimates), yet the minimum cost may be clearly apprehended. Colonels Anderson and Fife recommend (*vide* paras. 13 and 14) an anicut with a canal round the barrier. Now they justly observe in another place, paras. 69 to 72, that similar works for the first barrier (which includes a lesser distance) must cost 30 lakhs (exclusive of establishment). The original projectors always regarded the third as the longest and worst of the barriers, and put down its cost at one-fourth more than that of the first. Thus we may be sure that the works at the third barrier cannot cost less than 35 or 40 lakhs, though they may cost more. And still there are the works in the river near Chanda, which must amount to several lakhs more. Thus to open the navigation from the foot of the third barrier to Chanda would cost more than 40 lakhs, or 400,000*l*. As the Government of India are aware, the works at the second barrier, already sanctioned, afford navigation to the foot of the third barrier, 300 miles from the sea. The distance on to Chanda will be 70 more miles. Colonels Anderson and Fife now say that the navigation should be opened for the additional 70 miles. But this will cost 40 lakhs of rupees. And while fully acknowledging the importance of this section of the line, I should yet regard a proposal to expend 40 lakhs of rupees, for 70 miles of navigation, as excessive. And this is one out of several reasons why I refrained in 1863, and do still refrain, from recommending this part of the scheme. No; if the works as far as Chanda are to be undertaken, we could not stop there; it would probably not be worth while for Government to proceed so far and no further. In that case, indeed, Government must be prepared for various other works, which would supply a further line of navigation above Chanda. And this principle indeed is prescribed in the Secretary of State's Despatch above alluded to.

16. The second part of Conclusion 5 proceeds to recommend a further examination of the river and its tributaries. In this I quite concur; indeed I recommended this officially in 1864. The subject is more fully explained in a separate Memorandum by Colonel Fife (*vide* Appendix II.), to which I will advert in another Minute.

17. Conclusion 6 is in this wise:

“Excluding the portion of the estimate which relates to the construction of a road from Seroncha to Chanda, the expenditure contemplated is approximately sufficient for the scheme, as at present defined by the Government.”

It is, of course, very satisfactory to know that such is the opinion held by officers with such good means of judging.

I have only to observe, that although in some parts of the previous correspondence this proposed road may have been mentioned as being from Chanda to Seroncha, yet the road recommended in my Report of January 1863, and sanctioned by the Government of India's Despatch of July of that year, and since surveyed, is only from Chanda to Mogellie, at foot of third barrier. The distance from Chanda to Mogellie is 70 miles, whereas from Chanda to Seroncha it would be about 120 miles. I have never recommended, and still do not recommend, a road being made all the way to Seroncha, but only to Mogellie. The above distinction is noted here, because, inasmuch as Colonels Anderson and Fife object to that road, partly on account of its cost, the difference, as above explained, is considerable.

18. The substance of Conclusion 7 may be thus extracted:—

“Government will not reap any considerable direct return from the expenditure; but the general improvement of the country, and the increase of trade, which will be induced by the opening of the communication, will be sufficient to justify the outlay.”

In this I would express a general concurrence. In my Report of January 1863, indeed no expectation of immediate direct return was held out (*vide* paras. 56 and 100). Indeed there will not be any such return for the first few years. However, if the navigation shall be really well opened, there will be hundreds of boats, and thousands of tons of merchandise, within a comparatively brief period, and then tolls may be realised. Thus, ultimately,

ultimately, there will be a direct return. But when all that shall have happened, a large indirect return may be looked for with some certainty in the general increase of the public revenues. This was indicated in my Report of January 1863. Since then those anticipations have derived strength from experience. The revenues of the Seroncha District have increased about threefold in five years; those of the Chanda District (including local funds) have increased 30 per cent. in the same period; those of the Nagpore country by 50 per cent. The trade returns, prepared by actual registration, for the Nagpore country during the past three years, show an increase of from 35 to 40 per cent. within that period. If all this happens without navigation and without railways, what may be expected to happen when the country shall have been placed in the enjoyment of both these advantages?

19. Conclusion 8 is as follows:

"The construction of the works at the second barrier should be carried out simultaneously with those at the first barrier."

In this I would express entire concurrence; and I would invite attention to paras. 100 to 111 of the Report, where the reasons for this are given.

20. In Conclusion 9 it is urged that the stock and establishment should be kept up at the lowest scale, compatible with efficiency, on which I have nothing to observe. It is then said that "supplies for the workmen at the second barrier should be obtained through the aid of the civil authorities." In this I entirely concur; and would ensure the Deputy Commissioner of Seroncha doing all that might be possible. It is said further that "private stores should be carried (*i. e.*, by the Transport Department) only so far as can be done with the minimum of stock and establishment, as above recorded."

This accords exactly with paras. 127 to 129, inclusive, of my Report of January 1863.

21. The several conclusions having thus been severally touched upon, it is necessary now to proceed to the sections of the report itself.

22. Section 1., paras. 1 to 21 inclusive, contains "Preliminary Observations." The substance is, that Colonels Anderson and Fife recommend works being undertaken from the foot of the third barrier to Chanda; and consider that to make a road from Chanda to Seroncha would not, under the circumstances, be appropriate.

23. As respects the works from the foot of the third barrier to Chanda, the main objection, on the score of expense, has been stated in the foregoing para. 15 of this Minute, and need not be repeated. In this section of their report Colonels Anderson and Fife say that—

"The completion of the project to the above limit (that is, up to the foot of the third barrier, as heretofore sanctioned), would probably be sufficient to justify the outlay contemplated" (para. 11).

Still they recommend that the work be carried on past the third barrier to Chanda, because "the merits of the route would then be put to a fairer test, and Government would be able to obtain a better idea of the nature and extent of the traffic" (para. 19).

I would admit most of these arguments; indeed they agree essentially with paras. 121 and 122 of my report of January 1863.

But there remains the objection of expense, as already given, and the probability that when once Government undertake the works at the foot of the third barrier to Chanda, they are virtually committed to several other operations.

24. But, in so far as the recommendation of Colonels Anderson and Fife comprises professional inquiry as to the possible works at the third barrier and the river above, I would fully support it. Indeed, in 1863-64, I did particularly advocate that the requisite engineering staff should be told off for this duty.

25. As respects the road from Chanda to Seroncha, it is shown that if the navigation be carried only up to Seroncha, a sufficient effect would not be produced on the country round Chanda, and that the line along the river bank would not be so good as a straighter line proposed by the Deputy Commissioner of Seroncha (Captain Glasford). All this may be very true; and indeed if such a road were really proposed, it would be open to the above criticism. But it may suffice to observe that no such road has ever been recommended by this Administration, or sanctioned by the Government of India. What has been recommended, approved, and surveyed (but not commenced), is not a road from Chanda to Seroncha, of 120 miles, but a road from Chanda to Mogellee, of 70 miles; and the things are quite different.

26. Referring to Mogellee, at foot of third barrier, Colonels Anderson and Fife remark (para. 10) that "it is a wretched hamlet in the middle of the jungle. It is very unlikely that merchants would establish themselves there; and consequently goods would be sent by land the whole way from Chanda to Seroncha." This view is repeated too in para. 18. Now the above description is true enough as regards Mogellee as it now is. But if it is to be argued that, therefore, Mogellee could not be changed and so improved as to be transformed, then I submit that such an argument is not entitled to any weight: for this description of Mogellee would be equally applicable to any place on the whole length of the Upper Godavery, from Chanda to the Delta. What were Doomagoodium and

Seroncha a few years ago but "wretched hamlets"? Yet now the former is studded over with European houses and workshops; and the latter has a court-house, gaol, barracks for native troops, and so on. As sites are on the river bank, there is no particular objection whatever to Mogellee. It has much culturable ground in its neighbourhood, and if selected as the head of the navigation, it would soon become what Seroncha and Dooma-goodium now are. In fact, in para. 45 of their report, Colonels Anderson and Fife look forward to extensive building yards for boats being set up at or near Mogellee. But, in reality, any questions about a mere local site do hardly deserve a place in this discussion. The real question is, whether the navigation should commence from the foot of the third barrier or not. If it should not, there is nothing further to be said. If it should, then Mogellee would very soon be improved as a site in a manner befitting its new position, and would be quite as good a spot for warehouses and traders as Seroncha or any other place.

27. Section 2 of the report relates to the "Probable traffic on the Godavery by steamers."

The substance is, that Colonels Anderson and Fife do not consider, judging from the experience of the Ganges and the Indus, that steam navigation on the Godavery is likely to be successful or remunerative; that the idea of having locks of sufficient size for steamers of any considerable beam or draught should be abandoned; and that the proposed dimensions of the locks, namely, 200 feet by 30 feet, should be reduced to 150 feet by 25 feet, inasmuch as thereby a considerable sum of money would be saved. Under this view, they would only have a few "small steamers for conveying passengers and a very limited quantity of valuable cargo" (para. 43)—such indeed as we now have for the use of the Public Works Department; but there would be no tug steamers, and reliance would be entirely placed on country boats.

28. In support of this view, they note that the 30 feet breadth of lock was intended by Major Haig for steamers with stern-wheels, such as those used on American rivers; and that the Government of India sanctioned this dimension on the understanding that suitable steamers of sufficient power would be found. But they urge that stern-wheel vessels might not suit the "currents" and occasional "whirlpools" of the Godavery (*vide* para. 25), and that side-paddle-wheel vessels might be too broad for a 30-foot lock, or rather that "side-paddle-wheel steamers of 30 feet beam in all would not have sufficient power" (para. 25, towards the end). They then proceed thus: "Until the width of lock best adapted for steamers is decided, the Government may be committing themselves to an expenditure which may prove ill-judged; the locks may prove too small for the proper class of steamers."

Now I have always supposed, and still suppose, that Major Haig will be able to find steamers, or to get such made, which will be strong enough for the service required, and also pass through a lock of 30 feet breadth. The doubts expressed in the report may or may not be well founded; still the point is one of fundamental importance; and I would fully endorse the opinion that there ought to be assurance, based on decisive inquiry, that the locks are really broad and long enough for the requisite class of steamers.

29. If, then, Colonels Anderson and Fife had stopped here, I should have been able cordially to agree with them. But they proceed (paras. 26 and 27), first, to suggest the alternative of having locks for country boats only, with the prospect of having steamers in the intermediate reaches. This would be open to manifold objections. The extra plant, stock, establishment, and the extra expense, would be such as to deter any private company, and would probably be more than even Government would bear. Again, if wanted for change or repair, how are the vessels to be brought backwards and forwards over the barriers? It is remarked, indeed (para. 27), that "they could be taken over the anicuts on the top of the freshes." But if they got down the river in this way, how would they return? The returning would be critical and uncertain. Indeed the remark above extracted seems an inadequate description of a business which would be really serious; as was indeed found to be the case with the small flotilla in 1862. It was an arduous operation to conduct those vessels over the barriers, even at the full flush of the floods. But it does not appear that Colonels Anderson and Fife actually contemplate such an alternative being adopted, for they go on in para. 29 to deprecate any expenditure being incurred for providing steam navigation on the Godavery, because "it is highly improbable that steamer traffic will pay."

30. In support of this view, they give, in paras. 30 to 42 inclusive, much valuable and interesting information in respect to the Indus, and some considerations respecting the Ganges. The result may be summed up by the following extract:—

"Steam navigation does not pay well enough to enable it to compete with the railway on the Ganges; and on the Indus pays barely five per cent. How can it be expected it can be worked profitably on the Godavery?"

Now, whether steam navigation on the Ganges has or has not answered all the hopes formed of it, still it was long carried on by Government; it was most valuable throughout the troubled years of 1857 and 1858. It is still carried on by private companies, notwithstanding that railways run parallel with the river, both on the east and on the west. Surely its existence has been, and is still reckoned as an element in the national resources. So with the Indus, the steam navigation is surely considered an integral part of the system of communication. If it pays five per cent. now, private companies will be formed, and obtain

obtain a larger return ultimately. Again, has it not always been the cherished hope of the Punjab Government to obtain powerful steamers with light draught for the five rivers?

31. I could not, therefore, recommend that when an outlay of a million sterling is to be incurred for the navigation of the Godavery, the Government should give up so important an adjunct as steamers, on the view of saving some items of costs in lockage.

32. The uses of steamers on the Godavery might be both commercial and political. The commercial use would be to tug up the river convoys of country boats freighted with merchandise, or else to tow flats, as is done on the Indus and the Ganges. One of the expectations of the advocates of the navigation project has always been, that as the river rose in June, whole fleets of laden boats would run down in a few days from the Nagpore country to Cocanada, on the sea coast; and thereafter boats would constantly be passing down the river while the rainy season lasted. In this manner, the great bulk of our exports would be carried away. This is what actually happens, and has always happened on our own Mahanuddy river on a lesser scale; and the same thing was expected to happen on the Godavery on a much larger scale as soon as the navigation should be opened. Then, as these boats shall in great numbers have passed down-stream with ease, they would return up-stream with difficulty. If they return while the water is high and the current comparatively strong, then they must either be towed from the banks or tugged by steamers. If the import trade should be valuable, then tugging might be resorted to. If tugs were not available, then the boats would have to wait for the tedious and laborious navigation of the autumn or winter months, and to labour up-stream in the same way as boats now ascend the Mahanuddy in the winter and spring months. Some could afford to wait; others could not. Those which could not wait might be broken up for timber at Cocanada, in the manner which used to prevail with the Indus boats at Kurrachee. The possible exigencies of the export and import trade of these Provinces does not seem to have been fully adverted to by Colonels Anderson and Fife in their report; but from the above brief sketch, it may be evident that steam tugs may play an important part hereafter on this river, and that it will at all events be prudent to make provision for employing them, should they be wanted. Or again, if it pays private companies to dispatch steamers with flats up and down the Ganges, despite the competition of railways on all sides, it may be remunerative for them to do the same on the Godavery, where there will be no competition of any kind.

33. Regarding the political use of steamers on the Godavery (which would appear not to have presented itself forcibly to Colonels Anderson and Fife), the following passage may be extracted from a memorandum prepared in 1865 by Major Haig in England (page 48):—"The map shows that for 400 miles the Godavery and the Wurdah form the dividing line between the British territories on the north bank, and those of the Nizam on the south. I have shown that with light draught steamers, the river only partially improved may be navigated for the whole year. It will thus afford the means of delivering a body of troops at any point, at any time, along the whole of this length of frontier. Hyderabad is now only accessible from the south-east and west, and in each case by road only; on the north it is distant 400 miles from Nagpore."

All this is quite true. This right bank of the Godavery is near to the old haunts of the Rohillas. It has often been overrun by them in 1857 and other times of disturbance. In the event of any general trouble arising, it would have to be well watched. Recently, on grounds of general prudence, Seroncha has been garrisoned by a detachment of native troops. And that is the only military station between Chanda, in the Nagpore country, and Rajahmundry, in the Madras Presidency; or between Hyderabad, in the Deccan, and Raepore, in Chutteesgurh. If, then, the British Government is to incur a great outlay on the navigation of the Godavery, it seems but proper, indeed indispensable, to provide the means of despatching by steamers both troops and stores to such localities as those above indicated.

34. I would add that Colonels Anderson and Fife justly adduce (para. 30) "cheapness of fuel" as being in the favour of steam navigation on the Godavery; indeed it is difficult to imagine a line in any country possessing greater advantages in that particular than this river. In this way steam navigation, if it came largely into play, would cause the overwhelming jungles to be gradually cleared, and the climate rendered more salubrious thereby.

35. The main reason why they advocate the relinquishment of all provision for steam navigation is, that some money would be saved by constructing smaller locks for country boats, instead of larger locks for steamers. Now what would the saving be? In para. 90 of the Report, they show that by reducing a lock from 200 feet by 30, to 150 feet by 20, there will be a reduction of cost from 235,000 rupees to 160,000 rupees, which represents a saving of three quarters of a lakh, or 7,500 £. on each lock. This saving could be effected only on one lock (the tail) at the first barrier, the head lock having been now finished on the sanctioned dimensions of 200 by 30 feet. At the second barrier there would be perhaps two locks. If the works at the third barrier, and thence to Chanda, be undertaken, we cannot yet say how many locks will be required; but there may be three. Thus at the three barriers there might be six locks of contracted dimensions, and a reduction of three quarters of a lakh on each of these would represent a total saving of 4½ lakhs. Sup-

posing the total outlay to amount to 100 lakhs, or one million, for all the three barriers, the saving would be under five per cent. Thus, according to the proposal of Colonels Anderson and Fife, provision for steam navigation would be sacrificed to save some five per cent. on the total outlay, and a valuable part of the project would be sacrificed for the sake of a comparatively diminutive saving.

36. Section 3 refers to the "Probable traffic on the Godavery by country boats," and constitutes an interesting and valuable portion of the Report. Colonels Anderson and Fife show the great boat traffic which has arisen since the construction of canals in the deltas of the Godavery and the Kistna; the "extraordinary increase" of trading craft on the Ganges; the recent expansion of water carriage on the Indus; they apprehend that such a development would not occur for some time on the Upper Godavery, but that something of the kind would ultimately occur; and they deem that "if similar results are obtained by opening out the navigation of this river, the considerable outlay required for the purpose will have been well laid out" (para. 54). Further, they anticipate "that the bulk of the regular up and down traffic (by country boats) would be confined to the period comprised between 15th September and the end of February; and for the smallest class of boats, to a somewhat later date, or in all about six months. For about half that period the draught of boats would be limited to two feet on the average, if not less" (para. 45). They add, too, that, "except during the freshes, the current of the Godavery is very much slacker than that of either the Ganges or the Indus," and "its channel is infinitely less variable" (para. 59).

37. These anticipations are more sanguine than any which were held out in my report of January 1863. Still, the above dicta are in the main very satisfactory to this administration. The only expression in which I should not quite concur, is that which implies that the boat traffic would be confined to the period between September and April. It has been seen from the preceding para. 32 of this Minute that we have heretofore looked to large number of laden boats going down-stream in the monsoon season. In their para. 45, indeed, Colonels Anderson and Fife do contemplate the last-named class of traffic; for they say, "If boats were ready with a cargo at the foot of the third barrier, they could make a trip down the river," and thus "a considerable traffic might be carried on during the freshes at a very insignificant cost of transport." This is no doubt very true; still they seem hardly to have attached sufficient weight to this very important circumstance, because they remark that "the three months from 15th June to 15th September are the most unfavourable period of the year for ordinary boats." This remark is only applicable to the up-stream trips. For the down-stream trips this season would be the best possible.

38. In this section (para. 55) Colonels Anderson and Fife, when considering generally the prospects of trade in the country of the Godavery, advert to the revenues of the Central Provinces, which they observe to have risen from 85½ lakhs to 90½ lakhs. This is exclusive of local funds, which, as explained in the Administration Report for 1864-65, really form part of the public income. With these the total income of these provinces will be 120 lakhs for the current year, 1866-67. But in reality no such calculation can really be of service in solving the Godavery problem, for these figures refer to the whole of the Central Provinces, of which the northern districts, comprising the Vyndian region and the basin of the Nerbudda, have no concern or interest whatever in the Godavery. Therefore, any sort of calculation depending on aggregate statistics of the whole Central Provinces would be much too favourable to the Godavery project. The country really interested in this project is that of Nagpore proper, primarily; and secondarily, that of Chutteesgurh, as explained in my Report of January 1863. But if the Mahanuddy shall be opened, then most of the Chutteesgurh trade would tend towards that river. Now the revenues (including local funds, for the country of Nagpore proper stands for 1865-66 at 44½ lakhs (445,000 £), and for Chutteesgurh at 11 lakhs (110,121 £).

39. Sections 4 and 5 relate to the first barrier project, the past expenditure, the works now in progress, and those proposed. These sections may be conveniently treated of both together.

40. It will be in the recollection of the Government of India, that for the navigation at this barrier there are two projects; the major project, originally proposed by Major Haig, and now being proceeded with, involving a canal of 20 miles from Doomagoodium to Gola-goodium; the minor project, proposed subsequently by Major Haig, as a *quasi* temporary work, to save immediate expense, involving a canal of five miles from Doomagoodium to Gongole, together with blasting of the rocks in the river bed for some distance below the last-named point. Colonels Anderson and Fife advise that the major project be relinquished, and the minor project only carried out. I regret that I am unable to support this advice.

41. Colonels Anderson and Fife base their recommendation, as above, upon grounds, not of efficiency, nor of suitableness of the works to the future navigation, nor of engineering propriety, but solely on reasons of expense. They explain (in para. 69) that Mr. Schmidt's estimate for the major project amounts to 30 lakhs of rupees (exclusive of establishment); that Major Haig's revised estimate amounts to 18 lakhs; but that Mr. Schmidt's "estimate probably represents the outlay required to carry out the project with a nearer approach to accuracy

accuracy than that prepared by Major Haig" (para. 72). Then they say (same para.) "Had the revised estimate prepared under Major Haig's instructions been sufficient to carry out the long canal in a satisfactory manner, we should not have hesitated to recommend it in preference to the short canal, combined with blasting operations in the river, as being the most complete and certain of the two projects."

42. Now they show (para. 93) that the minor project will cost, inclusive of work already done, 16,82,426 rupees, or 17 lakhs. To this, however, must be added the sum of upwards of 2½ lakhs already spent on the long canal of the major project, which would be thrown away in the event of the minor project only being adopted. So that the total cost, in justice to the comparison with the major project, must be set down at nearly 20 lakhs. But while the estimate of 30 lakhs for the major project is a tolerably certain one (so far as anything like certainty is attainable at all), there is one particular element of uncertainty in the above estimate for the minor project. In discussing this last-named estimate (para. 92), Colonels Anderson and Fife remark:—

"To this must be added the cost of blasting operations in the river, of which we can form no estimate that can be relied on; but we imagine it will exceed 50,000 rupees, and may rise to a lakh."

43. In para. 73 they very justly point to the difficulties of this blasting, as "the operation is one that will need great judgment," and one that "if carried beyond the proper limit would have the effect of bringing rocks to light which had been submerged, and of increasing the current as well as the obstructions at the rapids and shoals higher up."

All this coincides exactly with what I learned when examining the Mahanuddy in 1863. There, also, the obstructions are caused by rocks, which it was once proposed to remove by blasting; but this method was deprecated by the government superintending engineer, Mr. Armstrong, and was rejected by Colonel Rundall, the chief engineer of the Orissa Irrigation Company, and in consequence of this a canal was proposed. It may be remarked, too, that in the earlier projects for the Godavery, when the efficiency of the navigation was mainly regarded, the engineers thought of canals and rejected the blasting plans. This view, as I believe, prevailed up to 1863. It was when the estimated cost rose high, and considerations of expense became so pressing, that blasting began to find some favour.

44. In the case of the first barrier, therefore, it will be well, if possible, to avoid having recourse to blasting. It is true that we propose to adopt this method at the second barrier, and perhaps we may have to try it at the third barrier; but that is no reason why it should be adopted at the first barrier. On the contrary, knowing the objections to blasting, it were preferable that we make quite sure of the first barrier by having a canal there, if that be reasonably practicable.

45. If, then, the minor project recommend itself only on the score of saving outlay, it is to be noted that 30 lakhs is the estimated amount for the major project, and 20 lakhs for the minor (establishments being excluded in both cases); though the 30 lakhs does seem to be a maximum, while the 20 lakhs may be exceeded, owing to the doubtfulness of the blasting. The saving, then, may amount to 10 lakhs. Is this saving so great, in relation to the total outlay on the whole scheme, which must ultimately amount to a hundred lakhs, or a million sterling, as to induce the Government to abandon a major project admitted to be "more complete and certain," which, too, has already far advanced, in favour of a minor project of an inferior character respecting efficiency, and at least one point of uncertainty respecting cost?

46. I would submit that inasmuch as the major project does agree in its principles with the proposal of the eminent officers who first projected the general scheme, as it is preferred by Major Haig, by Mr. Schmidt, by Mr. Isaac; as it is pronounced by Colonels Anderson and Fife to be the more complete and certain scheme; as it has been commenced, and has far advanced, so that, besides the head-work, there have been 12 miles of canal done at a cost of 2½ lakhs, all of which would be thrown away if the project be changed, I would recommend that the major project be completed at the full estimate. Doubtless the difference in cost (10 lakhs) is considerable; but still with operations of such magnitude, it represents a proportion of not more than one-tenth. Doubtless a portion of perfect efficiency has sometimes to be given up when the outlay proves excessive. But in a case like this, where Government has determined on a large outlay, it were apparently preferable to do the work well; to have, what Colonels Anderson and Fife term, "a complete and certain work;" and not to sacrifice efficiency in order to save a proportion of the outlay of not more than one-tenth. In other words, I doubt whether the saving is large enough to justify a departure from the most approved designs on an occasion like the present.

47. Supposing it to be thought that if the minor project only be completed now, the major project could be added on hereafter, should necessity be practically demonstrated, I would submit that such a course would not be likely to prove satisfactory to Government. If, after a work had been finished with a heavy outlay, it were proposed to add another 15 miles of canal, such a proposition would surely be discouraging, and would give rise to the idea that there was no finality in the works. It would seem better to avoid, if possible, second-rate measures, and to follow from the first those plans which are seen to be the best according to our engineering information.

48. In para. 70 of the report there is this passage:

"Further, he (Major Haig) considered that the shorter (*i. e.* the minor) project would be necessary in any case, as the navigation by the canal to Golagoodium would be liable to occasional interruption from breaches in the embankments during extraordinary high floods."

To this it may be replied that if the full project, as estimated for by Mr. Schmidt, and supported by Mr. Isaac, and as originally designed by Major Haig himself, be adopted (as I would propose that it be adopted), then the minor project would not be required as an adjunct to the major.

49. In para. 75 of the report, Colonels Anderson and Fife observe to the effect that if the minor project had come under the consideration of Government at the outset, some time and money would have been saved, and some sort of channel, though not the best, might by this time have been opened. This may be correct, though open to the qualifications as explained in the foregoing paras. The fact is, however, that the major project is the one approved by all the engineers, including Major Haig. And as they had a general authority to proceed with the work, they naturally worked upon that project. The minor project was subsequently and intermediately suggested by Major Haig merely as a temporary measure, and with a view to saving of immediate outlay (*vide* Major Haig's letter to the secretary to the Chief Commissioner of the 16th November 1863).

50. In their paras. 94 to 97 inclusive, Colonels Anderson and Fife very justly note the high rates of charge for work at the first barrier, and correctly explain the main causes thereof. This matter having been already adverted to in the preceding paras. 8 and 9 of this Minute, need not be dwelt on here. To some extent these high charges may prove unavoidable even in the future works at the other barriers. But endeavour will be made to effect some economy by employing the aid of the civil authorities to obtain workpeople and to provide supplies of food and other necessities for the gangs.

51. Section 6 of the report relates to works at the second barrier, and comprises professional criticism on the plans proposed by Major Haig. Colonels Anderson and Fife express general approval of these plans, with certain modifications and additions. I have no observations to offer, save that this criticism seems to be very sound and useful.

52. In para. 104 they observe that some charges may possibly be largely reduced in the case of the second barrier works especially, if the deputy commissioner of Seroncha can induce merchants to establish shops to supply the workmen with food. Every effort, if needed, shall, of course, be made by the civil authorities for this purpose.

53. Section 7 of the report refers to "improvements to the river bed between the barriers." In the previous estimates (of a general character) for these works, groins were included. Colonels Anderson and Fife now "deprecate any outlay whatever for groins," On this I have no remark to offer.

54. Section 8 of the report contains "general remarks on expenditure." A very good classification of all the past expenditure is given in para. 121, on which I have to remark as follows. It thereby appears that the total expenditure from the outset in 1853 to the end of 1865 has amounted to 28½ lakhs of rupees, or 280,000 £. Of the above, 4½ lakhs have been spent on the tramways, which are pronounced to be for the most part "unprofitable works" (*see* para. 87). This is no doubt true, though the tramways have been of some use at times. As the Government of India will remember, their abandonment was recommended in my report of January 1863. Their construction must be attributed to the urgency of the anxiety which was naturally felt in 1861, both in England and in India, for the intermediate opening out of routes for the transit of cotton from the interior to the coast.

55. The cost of actual work may be sent down thus:—

	Lakhs.
Actual work in canal and river bed - - - - -	8½
Recruiting, hutting, &c. (of labourers) - - - - -	2½
Materials, &c. - - - - -	1½
TOTAL - - - - -	12½

For this, it may be asked, what is there to show? There is indeed much to show, though not perhaps quite so much as there ought to be. There are a massive anicut or dam right athwart the main stream of the river, a large lock for steamers, some scouring sluices, some 12 miles of canal, some blasting and other work in the river bed. If even for the above considerable out-turn of work the cost, as abstracted, seems high, it is to be borne in mind that these structures are raised, not in an inhabited part of the country, but in a remote and desolate part, whither labour and stores and material, and even food for the workpeople, have to be transported from a distance.

56. But the 12½ + the 4½ lakhs only amount to 17 lakhs, leaving a residue of 11½ lakhs out of the 28½. How then has this residue been expended? Of this, 1½ lakhs have been expended on boats and steamers, and the small flotilla is still on the river; and some 2½ lakhs on tools, plant, and machinery, all which is still in the yards and sheds. There has one lakh been spent at Doomagoodium, the head quarters of the engineering staff, in this way:

way: "Station improvement and accommodation for establishment, $\frac{3}{4}$ lakhs; buildings for grain and transport department $\frac{1}{4}$ lakh; in all one lakh. And there are sundries to the amount of $\frac{1}{4}$ lakh. The above items aggregate five lakhs. This expenditure really represents the setting up, so to speak, of the general operations. It is impossible for the State to embark on a work of this magnitude without preliminary outlay. Private enterprise is subjected to the same thing. A railway company or an irrigation company has to incur the same sort of expenditure. All the above items were, more or less, necessary. If the amount of some be high, still the difficult character of the country must be borne in mind. What really causes disappointment when these kind of items mount up so high, is that the engineers did not, perhaps could not, adequately foresee and estimate for such cost. And thus, although the estimates for works, *per se*, may be correct enough, yet the subsidiary expenditure is seldom submitted to Government beforehand.

57. There still remain $6\frac{1}{2}$ lakhs out of the $28\frac{1}{2}$ to be accounted for as follows: Establishments five lakhs, and exploring expenditure $1\frac{1}{2}$ lakhs; in all $6\frac{1}{2}$ lakhs. This includes all the charges for salaries of officers and subordinates spread over a period of 12 years (*i. e.* from 1853 to 1865). These servants of Government have during this period been engaged in trips of discovery, in surveys, in designs and estimates, in inquiries of various kinds, and in directing the execution of all the works mentioned in paras. 54 and 55 of this Minute. These charges are, no doubt, high; but then the uncertainties arising out of operations and projects, altogether without precedent in India, and perhaps almost without precedent in any country, have caused changes of plan, which again have occasioned doubts in the mind of authority, which further have caused frequent delays. All this (hardly perhaps to be wondered at, under the circumstances) does inevitably tend to raise the cost of establishments disproportionately to that of actual work. But then much of these inquiries do subserv to the furtherance of work which will have to be executed, though not yet commenced, and will not recur. So that the starting is the part most fraught with, apparently, barren expenditure. Thereafter, the operations will go on more quickly and cheaply. And, under any circumstances, to devise and set about so extensive and arduous an enterprise over a space of country which, though full of promise, and richly endowed by nature, is yet, without any exception, the most desolate, the most unhealthy, and the most neglected tract in the whole peninsula of India, must be very expensive. Still it may be a source of some satisfaction to the Government of India to know that the efforts put forth are not altogether unfruitful; that a flood of light has been thrown on things previously unknown; that foundations broad and deep have been laid; and that the opposing difficulties have been to a large extent measured, and to some extent surmounted. But besides the actual outlay of treasure there has been a sad expenditure of what cannot be exhibited by figures, namely, human stamina and energy. When it is remembered how many talented and gallant men have within the last few years served on these works, have faced the inclemency of the climate and country, and have been constrained to depart in shattered health, then the entire cost, in the higher sense, of this great project can be appreciated.

These remarks are meant to explain, rather than to justify the high rate of expenditure. This rate is indeed becoming so high as to necessitate the strictest economy, for the furtherance of which this Administration will always do its best.

58. The general establishment, and the amount of plant, machinery, and the like, are deemed to be too high in para. 127 of the Report. There does not seem, however, to have been any undue strength of engineering establishments, especially when the insalubrity of the country and the difficulty of repairing losses and casualties are considered. There may have been too much of establishment in the transport agency, but that department was a peculiar one. By mention of the large amount of plant, allusion is made to the purchase of machinery. This point has been adverted to in the preceding para. 9 of this minute. The general remarks in this section, however, will be useful for the further enforcement of economy.

59. In their 126th paragraph, Colonels Anderson and Fife remark that "every opportunity should be taken by the executive officer to place the labourers on a footing more nearly corresponding with that which obtains on other public works. At the second barrier works the ordinary plan should be tried of giving the people liberal wages and trusting more to their coming to the works without other inducement."

I quite acknowledge the truth of all this; and at the second and third barriers effect may be given to this view. But still it may be observed that at the first barrier, unless the engineers had recruited their working gangs by a special agency in the coast districts, and then conveyed the men to their destination, and when there, fed and lodged them, thereby adding much to the cares and troubles of the Administration, the execution of these fine structures at the then stage of the operations would not have been possible in so wild a country. But it is a method only to be adopted under pressure of necessity, and to be altered or given up as soon as practicable.

60. After section 8, just noticed, which is the concluding section of the Report, there follow two appendices. (Appendix A.) contains notes of a journey up the Godavery River. This is highly interesting, but does not demand comment here, except, perhaps, to observe that it is satisfactory that Colonels Anderson and Fife were able to proceed so far up the river, with comparatively so little difficulty, at so dry a season of the year.

61. (Appendix B.) is a memorandum by Colonel Fife alone: "On storing water to increase the natural stream on the Godavery during the dry season, and to extend the navigation

navigation up the Wyngunga." The remarks about storage seem to be general. There has indeed been much generalizing already on this subject. The particular and practical question is, and has for some time past been, this: Can suitable sites be found? I have for the past two years been causing professional search to be made, and no site suitable for the river above the third barrier has been found. For the river below that barrier there are really remarkable sites for storage. These were fully adverted to in my minute on the River Pench Reservoir in 1864. Colonel Fife's remarks on the Wyngunga River touch upon a very large subject, which I will endeavour to treat in a separate minute.

62. In his para. 10, Colonel Fife remarks:—

"I should deeply regret if Major Haig's views (in respect of storage of water in reservoirs) did not receive the attention they deserve."

In point of fact, these views have received such attention from the Administration, for during the past three years an engineer of special qualifications (Mr. Hanna) has been employed in searching for sites for reservoirs, and two, if not three, first-rate sites have been found and reported on.

63. Colonel Anderson, adverting to Colonel Fife's memorandum, observes that it is not necessary to discuss any extension of the navigation project to the affluents of the Godavery. I do not quite follow him here, because it seems that if work at the third barrier be undertaken (and virtually Colonels Anderson and Fife do in their 20th para., section 1, recommend this), then the navigability of the Wyngunga ought to be taken into consideration.

64. He then goes on to remark as follows:—

"I would still advocate the entire completion of the works at the first and second barriers, and the clearance of works at the other parts of the river, before the third barrier canal is commenced. When the navigation is once open as far as Seroncha, and the passage of boats between that place and Seroncha becomes an established fact, the Government will then be able to calculate with some degree of certainty what improvement of traffic may be expected from continuing the navigation to Chanda;" and again, "If the work within the limits above recommended yields satisfactory results, the Government will have facts to guide them to a conclusion as to the merits of any extension that may be recommended."

This passage may be deemed hardly to consist with section 1 of the Report, which at first sight seems to convey a recommendation for extending the navigation up to Chanda. In para. 12, Colonels Anderson and Fife say that "the formation of a line of water communication from Seroncha to Chanda should not be definitely abandoned, until it can be ascertained for certain whether or not it is really practicable at a reasonable cost."

That sentence, perhaps, hardly involves an actual recommendation. But further on, para. 18, after pointing to the advantage of "selecting Chanda as a terminus for the navigation," they proceed thus:—"If the arrangement we have recommended be found worthy of execution, the merits of the Godavery route would be put to a fairer test." And in para. 20, thus: "Should these views be accepted, the river will be rendered navigable for five months in the year;" * * "from the Godavery to Chanda, boats could ply throughout the year. The total length of the line of navigation would be 400 miles, divided as follows:

	Miles.
Cocanada to Dowlaishwaram - - - - -	30
Dowlaishwaram to foot of third barrier - - - - -	285
Canal round barrier - - - - -	30
Wurdah to Chanda - - - - -	55
Total - - - - -	400

* Again, Conclusion 5, in the introduction to their Report (already noticed), is of the same tenor.

Now all this does seem distinctly to imply a recommendation for extending the navigation to Chanda, and so I have treated it in the preceding paragraphs of this minute.

65. Be that as it may, however, the passage last extracted from Colonel Anderson's memorandum, to the effect that the first and second barriers should be done first, and the third barrier and works beyond that should be kept apart to be, or not to be, taken up afterwards, has my entire concurrence. This indeed substantially accords with para. 122 of my Report of January 1863, which for facility of reference is transcribed below:—

"Thus the opening of the navigation to the foot of the third barrier would, at an expenditure of half the aggregate sum ultimately required, secure at least a part of the advantages of the entire project. This moderate expenditure would, so far as it goes, be remunerative. It would also apply a definite practical test to the whole project, and would show conclusively whether it would or would not be expedient to proceed with the remainder of the work. Moreover, it seems especially desirable that the efficiency of the work on the first and second barriers should be ascertained before the works on the third barrier are undertaken. To all this it might be answered, that to leave the works of the third barrier undone, would be to forego a part of the benefit which would otherwise arise from the works of the first and second barriers. This is so far true, inasmuch as the river would obtain a larger traffic if the third barrier were open, than if it were not. But then it

it may be better to execute works regarding which there is a comparative certainty, and which will secure a moderate benefit, rather than to undertake further works of a less certain character, in the hope of securing a larger benefit."

66. The only point of detail to be added is, that whereas Colonel Anderson contemplates that the opening of the first and second barriers would afford navigation up to Seroncha, I say that navigation would be afforded to a point beyond Seroncha, namely to the foot of the third barrier; and as that brings the navigation so near to Chanda, it would be well to open the land route on to that place. With this view I proposed, in 1863, and the Government of India sanctioned, the road from the third barrier to Chanda at a cost of about 7 lakhs of rupees. If Colonel Anderson's opinion as last quoted find approval, then I still urge that the above section of road should be opened, and improved, at least, if not actually made. Otherwise the opening of the first great section of the navigation from the coast to the third barrier will not get the Chanda traffic, which might fairly be gotten, and the project will not have, so to speak, quite a fair start. In 1863, when this road was sanctioned at a full outlay for construction, the opening of the third barrier and onwards was regarded as distant. But since the receipt of the Secretary of State's despatch of February 1866, it seems that the third barrier will after all be undertaken, and that its commencement may be nearer than has been heretofore supposed. Looking to this, then, I could hardly now recommend a full outlay for construction of this road. But still, regarding it as of much subsidiary importance, I would propose to improve it and make it passable for country carts as a fair-weather track. Thus, laden carts would be able to take produce during the dry months down to the third barrier, which produce would be shipped on board the boats as soon as the river had risen. If then (the former proposal of 7 lakhs being abandoned) one lakh of rupees were placed at the disposal of this Administration, the road could be rendered practicable as described. The line has already been surveyed and indicated by bench-marks, and the company of sappers in orders for Seroncha might be employed on the work during the ensuing cold season.

67. The Report by Colonels Anderson and Fife having been thus reviewed, the main recommendations on my part, which have been elicited thereby, may be thus summarized (details being omitted):—

1st.—That the canal from Doomagoodium to Golagoodium already in progress at the first barrier be completed according to the designs and estimates prepared by Messrs. Schmidt and Isaac, according to Major Haig's original project.

2nd.—That if the major project above described be carried out, the minor project canal, from Doomagoodium to Gongole, with blasting in the river bed, will not be required.

3rd.—That the works at the second barrier be sanctioned on Major Haig's designs, as modified by Colonels Anderson and Fife.

4th.—That the works at both the first and second barriers be prosecuted simultaneously.

5th.—That at the first and second barriers (and at the third barrier also, if that shall be taken in hand) the locks be of such dimensions as will admit steamers of sufficient size to tug convoys of boats and transport troops and stores.

6th.—That the road from the foot of the third barrier to Chanda, already sanctioned by the Government of India (in 1863), be only opened as a fair-weather line at a cost not exceeding one lakh of rupees, instead of being regularly constructed at a cost of 7 lakhs.

7th.—That a sufficient engineering establishment be deputed at once to prepare a design for the opening of the third barrier, such design to be compatible with the future navigation, not only of the Wurdah, but also of the Wyngunga.

68. Finally, in submitting the Report by Colonels Anderson and Fife for the consideration and orders of the Government of India, I would observe that though I am not able to agree with all the conclusions and recommendations by those officers, I am fully sensible of the value of the information and suggestions which they afford. Indeed, I believe their Report to have been drawn up with discrimination, impartiality, and with moderation, and that the care and completeness with which they have fulfilled a difficult duty will be found deserving of every commendation.

(signed) *R. Temple.*

Nagpore, 11 September 1866.

Enclosure 4, in No. 17.

MINUTE on the RIVER WYNGUNGA and its Affluents: their Navigable Capabilities; the Resources and Trade of the adjacent Districts, and the practicable Means of Opening the Navigation. By R. Temple, Esq., Chief Commissioner of the Central Provinces.

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SECTION I.—INTRODUCTORY.

1. In paragraph 4 of my Report of January 1863 on the Godavery, I remarked, in reference to one of the affluents of the Godavery, namely, the Wyngunga, as follows:—

“The Wyngunga rises in the Sautpoora Hills north of Nagpore. Emerging thence, it it runs south, through the heart of the Nagpore Province, to its junction with the Wurdah (or, more strictly, the Pranheeta), a distance of 430 miles. This river has been examined carefully by Messrs. De Gronsilliers and Farley in 1861, and must, I fear, be pronounced utterly unnavigable. This is a very unfortunate circumstance.”

Present condition of the Wyngunga.

This opinion was based on the report of those gentlemen, whom also I had had the advantage of consulting personally. And, with all the knowledge that has since been acquired,

acquired, there is nothing to shake the correctness of that information regarding that river in its present state. Accordingly, in my Godavery Report of 1863, no reference was made to the practicability, or otherwise, of constructing navigation works on the Wyngunga.

2. Since that time the professional investigations made under the directions of this Administration, respecting sites for reservoirs for storing water to increase the supply of the rivers, have shown that, while there are no sites yet found that would suit the above purpose for the Wurdah, there are some remarkably fine sites where water could be stored for the Wyngunga. The subject is unfolded in my minute on the river Pench (an affluent of the Wyngunga), prepared in 1864.

3. In March 1866, when Colonels Anderson and Fife passed up country, after their examination of the Godavery, Colonel Fife suggested to me, verbally, that the works at the third barrier of the Godavery might be so arranged as to fit in with a combination of works on the bed of the Wyngunga. In a separate memorandum, which Colonel Fife has attached to the joint report of himself and Colonel Anderson on the Godavery, he writes thus (paragraph 11):—

Colonel Fife's Opinion.

“The valley of the Wyngunga is fertile and populous, and it is almost destitute of means of communication to the eastwards, while to the westward it does not possess the same advantage as the Wurdah Valley in proximity to the railway. Under these circumstances, I cannot but regard the opening of the Wyngunga as of greater importance than that of the Wurdah, now that the railway already passes through the valley of the latter; and that its opening is necessary for the proper development of the Godavery navigation.”

Then, in paragraph 13, he proceeds to say:—

“If a weir were constructed across the third barrier (of the Godavery), at the point where the Wyngunga enters it, * * * we should secure * * * the connection of the Wyngunga and the Wurdah navigation.”

In the same memorandum there are further remarks in detail on this river, which may be noticed in the subsequent parts of this Minute.

The several foregoing considerations have directed special attention to the Wyngunga.

4. Meanwhile, in July of this year (1866) was received from the Government of India, copy of the Despatch from the Secretary of State of 8th February 1866, prescribing in general terms the prosecution of works at the third barrier of the Godavery, and observing that “Navigation must be made to commence at the nearest practicable point to the great cotton fields of Nagpore.” Then, after adverting to the probable outlay, the Despatch lays down that this sum “would still appear to be not too high a price to pay for between four and five hundred miles of river navigation open during the greater part of the year.” Due regard to those views renders it desirable to see whether the heavy works which will, under any circumstances, be necessary at the third barrier of the Godavery cannot be made to subserve the future navigation of the Wyngunga as well as of the Wurdah; and whether, when navigation is to be extended into the heart of the Nagpore country, the Wyngunga does not afford at least as good a natural highway as the Wurdah, perhaps even a better one; and does not equally offer powerful inducements for its improvement.

Despatch from the Secretary of State.

5. Since 1863, I had at various dates seen parts of the Wyngunga. But after meeting Colonel Fife in March last, I marched, in May and June last (1866), along the banks of the river, past all its more difficult and unnavigable sections, and right down to its junction with the Godavery at the third barrier of the latter, and further examined all the rocks of the barrier itself, as they are to be seen in the driest season of the year. I now proceed briefly to record the result of these inquiries, which are, of course, only of a general character.

Tour on the Wyngunga.

SECTION II.—THE WYNGUNGA AND ITS TRIBUTARIES.

6. The Wyngunga* rises at a point about 10 miles south of the town of Seone, near the southern ridge of the main Sautpoora Range, which runs from east to west across the peninsula,† and a little to the north of Nagpore. From that point it runs through rugged table lands due north for some miles, then turns eastwards, and then again southwards, passing through wild and narrow gorges, till at length, cutting through a mass of basalt, and then tumbling over a marble ledge, it finally debouches from the hills, and enters on the plains. To illustrate the rapid accumulation of drainage in the hilly regions, it may be noted, that just after its source the trunk-road crosses the Wyngunga with a bridge of two openings of 12 feet span. Thirty miles further on, the same road crosses the same river by a bridge with 12 openings of 50 feet span each. The river's course within the hills is about 100 miles long. Thus far its stream will, of course, never be navigable; but it is at or near the debouchure that excellent sites for reservoirs are to be found.

Source of the Wyngunga.

7. At first, on quitting the hills, the river flows for some 20 miles through a valley, with deep bays, as it were, running up into the hills, and highly cultivated. Then the valley opens

Its course below the Sautpoora Range.

* Within the Sautpoora hills, the river is called by the natives “Bân-gunga,” “or Ganges of the floods;” below the hills it is called “Wyngunga,” or “Ganges of the forests;” Wyn, being the Mahrathee the same as wun, or bun, meaning woods.

† The whole range has been for some time called by Europeans the Sautpooras, for convenience sake. The real Sautpooras, however, are only a section of the range further west between Hoshungabad and Nimar.

opens out, and forms one of the richest and best cultivated tracts in the country; and it continues to be fine, broad, and populous, on one side or the other of the river, for about 80 miles, to a point a little below the junction of the Kunhan. Thereafter this valley becomes of a variable character, sometimes broader, sometimes narrower, sometimes rich, sometimes jingly; but becoming more and more encroached on by hills and forests, and less and less inhabited, for about 90 miles, to a place called Chamoorsee. By this time the cultivation has become contracted to a narrow strip on each side of the river, and so continues for some 40 miles more to the confluence of the Wyngunga with the Wurdah; from which point the joint stream bears the local name of Pranbeeta. It will thus have been seen that the Wyngunga has a course of 100 miles within the hills not navigable at all; and of 223 miles below the hills. Of the course below the hills, the greater portion is more or less navigable at one season or other, except at certain points where serious breaks and obstructions occur, which will be noticed hereafter. Within this distance there is already some country boat traffic on various sections of the distance, but merely of a local and isolated character. Owing to the breaks and obstructions, there is not any *through* navigation whatever.

Its several affluents.

8. Below the Sautpoora Range, the first affluent which joins the Wyngunga, on the right bank, is the Choonee, which is partially navigated now, from its junction to the town of Rampylee, a distance of about 10 miles. The next affluent (on the left bank) is the Baug, now partially navigable, with the exception of one break, to be noticed further, to a point east of the town of Kamptee, a distance of 30 miles. Below this the Bhawunthuree joins in at the right; it drains an area of country which, though extensive, is wild and wooded, and it can hardly be counted as a navigable stream. Further down, on the right bank also, the Kunhan joins the Wyngunga. This rises in the southern ridge of the Sautpooras, and has a course of 100 miles. Its valley above the town of Saonair encloses a site suitable for a very large storage reservoir. A little above the town and station of Kamptee, the Kunhan is joined by the Pench, which also has a site for a similar reservoir. From Kamptee, the united stream of the Kunhan and Pench would be navigable for about 30 miles, till they join the Wyngunga. Above Kamptee, the Kunhan might be made navigable for some 30 miles; but there are some shoals and rocks, and this section is on the whole of a doubtful character. Further south, on the right bank, the Wyngunga is joined by the Amb; and further down, on the left bank, by the Choolbund. This stream flows through a splendid rice tract, but is hardly navigable. Both the Choolbund and the Amb have very little water after the rains are well over; and though, perhaps, in the event of the main river being largely navigated, a portion of these lesser feeders might be navigable, yet at the present time their navigability can hardly be counted on.

Its total navigable length.

9. Now, if certain breaks and obstructions, to be adverted to hereafter, could be overcome, the navigable lengths included in the sketch may be summarised thus:—

	Miles.
The Wyngunga below the Sautpooras - - - - -	223
The Choonee - - - - -	10
The Baug - - - - -	30
The Kunhan - - - - -	30
TOTAL Miles - - -	293

It will now be desirable briefly to examine the resources of the several territories through which the above channels run, in order to see whether any projects for opening the navigation of them throughout are worthy of consideration.

Compared with the Wurdah.

10. Before proceeding further, I may note that the above river system (omitting all lesser feeders of doubtful capacity) of 293 miles is really considerable. It greatly exceeds, of course, the mileage of the Wurdah above the third barrier, which may be set down as—

	Miles.
From crest of third barrier to confluence of the Wunna - - -	110
From mouth of the Wunna to Hingunghat - - -	20
TOTAL Miles - - -	130

SECTION III.—THE COUNTRY OF THE UPPER BASIN OF THE WYNGUNGA.

11. The valley of the Wyngunga may be best considered in two divisions: 1st, the country of the upper basin; 2nd, the country of the land basin. Each of these will be adverted to separately.

The upper valley.

12. The country of the upper basin was, for the most part, described in my report on a proposed tramway to run eastwards from Nagpore. From that the following extracts may be made:—

“The Wyngunga river, after the valley opens out, as above shown, runs through the extensive plains, and the rich rice-fields of Warra Seonee, of Hutta, and of Kamptel. Here the

the country is flat. The soil is well suited for those crops which require artificial irrigation. The richest portions of the plains are those which lie nearest to the skirts of the hills, towards the eastern extremity near Kamptee. On the western extremity, near the Wyngunga itself, the country is flat, yielding fine harvests of rice."

"The eastern portion forms the valley of the Baug river, which, rising far down to the south, flows nearly due north till it joins the Wyngunga near Kamptee. This valley is in a few places fairly cultivated, and has generally a fertile soil. But it seems to have been neglected for many years, and has now become much overgrown by jungle; while its climate has a bad repute. By the superstitious people the waters of the Baug river are supposed to be poisonous to drink."

"It is next to be observed that, below the main range, a broken series of hills, stretches southwards. And then sweeping round to the westwards, culminates near the Nowagaon lake, and thus forms the southern limits of the tract now under description. This tract is remarkable for its tanks, many of which assume the proportions of lakes. This is the lake region described in paragraph 12 of the Administration Report of the Central Provinces for 1861-62. These tanks are formed among the hollows and deep valleys, advantage being taken of the spurs and off-shoots of the hills, for the construction of the dams. In this manner, a vast reservoir can be obtained at a comparatively moderate expense. Among these the most notable has a circumference of above 20 miles."

"This lake region is bounded on the west by the Choolbund river, which joins the Wyngunga far down to the south. The country enclosed between the Choolbund and the Wyngunga teems with rice harvests."

"It will have been seen then that, over the whole of the country between the Baug river and the Wyngunga, the cultivation is, more or less, carried on by irrigation. From the base of the Sautpoora Range, all down the Wyngunga valley, there are splendid crops of rice, and some of the very finest descriptions of this product are cultivated. For the submontane tract Warra Seonee is the principal mart for rice, which is exported thence to Nagpore. South of this, in the valleys of Rampylee and Hutta, there is a mixed cultivation, and in places along the Wyngunga and its tributaries there are to be met with, rich soils, fine villages and excellent crops of wheat, gram, millet and oilseeds. During the dry season, in the very beds of the rivers, where the higher floods and back waters leave an annual coating of alluvial deposit, rich crops of the castor-oil plant, and fields of sugarcane are to be seen. The cultivation of rice and sugarcane is carried on principally from tanks. The best descriptions of rice here cultivated require more or less artificial irrigation. The more common descriptions ripen earlier and receive little aid in this shape, beyond the water which is retained by forming small dams across the fields during the monsoon. The next most important branch of cultivation is the sugarcane, which is carried on most extensively below the large tanks in the southern tracts. At present the cane is generally poor, and the cultivation carried on in a slovenly manner, no attention being paid to thinning out the cane, which seldom attains any great size. It is, however, an exceedingly profitable crop. Besides the above crops, wheat, gram, and oilseeds are cultivated, but principally in the beds of the shallow tanks, which are drained after the rice crops are off the ground."

"The next tract of country to be considered is that situate below the hill ranges above described between the Wyngunga river and Nagpore. The finest portions are those which are enclosed by the Wyngunga itself, and by its affluent the Kunhan. This a tongue of land with a fertile soil, in some places bearing a double crop during the year, generally well tilled, thickly populated, and abounding with large villages."

"The principal crops raised all over this tract are wheat, gram, oilseeds and millet. On the poorer soils near the hills, rice and some sugarcane is cultivated in places where irrigation is procurable; it might be cultivated to any extent. Cotton is not as yet raised to any great extent; but its culture is increasing, and may still further increase."

"There is really no waste worth mentioning, not even grazing ground for cattle; and at certain seasons the animals have to be sent to great distances for pasturage."

13. In the immediate valley of the Wyngunga, there are the following towns:—

Hutta -	-	-	-	-	-	-	7,335 inhabitants.
Kampta -	-	-	-	-	-	-	6,000 "
Toomsur -	-	-	-	-	-	-	8,263 "
Moharee -	-	-	-	-	-	-	8,738 "
Bhundarah -	-	-	-	-	-	-	16,440 "
Pohonee -	-	-	-	-	-	-	19,476 "

Towns on or near the river.

Of these, Pohonee has long been the seat of the manufacture of fine cloth fabrics, which have heretofore been exported to great distances. These may be supplanted by English-made fabrics, meanwhile they form an important branch of industry. The other towns are chiefly grain marts, though they have manufactures of cloths and of metals.

14. In addition to the above there should be mentioned here, the territory from the right bank of the Kunhan to the base of the hills which form the watershed for the rivers Wyngunga and Wurdah respectively. This tract contains the two sister towns of Nagpore and Kamptee, which with their suburbs have 170,000 inhabitants; and most of the finest villages in the whole country. In such villages all known Indian products are reared. In one of them, Mohpa for instance, there are no less than 400 wells at work. It is well indeed to bear in mind that Nagpore and the tracts around it are situated in the valley of the Wyngunga. From the Nagpore Fort (Seetabuldee) the eye, looking westwards, sees

Right bank of the Kunhan.

the various ranges of hills shutting out the cotton country of the Wurdah, but looking eastwards, sweeps over the unbroken plain stretching away for 40 miles to the Wyngunga, and cultivated almost to the last rood. This very productive area, from Nagpore to the Wyngunga, is indeed the "plain of Nagpore" described in paragraph 12 of the Administration Report of the Central Provinces for 1861-62. This tract used not to be a cotton-producing tract. What is commonly called "Nagpore cotton" does not come from around Nagpore itself, but from the valley of the Wurdah, from 30 to 50 miles distant. But this tract has begun to produce cotton since the springing up of the new demand in 1861-62, and now yields a considerable quantity of that article. In all other respects it is much superior to the Wurdah valley, being better inhabited, better tilled, and better endowed with resources, and (as a certain test) paying a 50 per cent. higher rate of land revenue.

Towns in the interior.

15. In this tract, besides Nagpore and Kamptee, there are the following towns:—

Oomrair	-	-	-	-	-	17,040 inhabitants.
Ramteak	-	-	-	-	-	12,696 "
Khappa	-	-	-	-	-	9,116 "

Of these, Oomrair has some celebrity from its cloth manufactures, which are even superior to those already mentioned at Pohonee.

Character of the agricultural classes.

16. The husbandmen of the Upper basin of the Wyngunga deserve a passing notice, as they are beyond all comparison the most hardy, industrious and enterprising of all the agricultural classes in any part of these provinces. The culture seen here in these times is not, as in many parts of India, of really ancient date, but is of quite a modern age. Without any attempt at an historical retrospect, it may be noted that the country was originally reclaimed under the auspices first of a pastoral Hindoo dynasty (still dimly remembered as the Cowherd "Gaolee" kings), and then of the Gond dynasty. It is not, however, probable, that much was done for agriculture. The real strides were made when the Powârs and Koirees immigrated from the north, and the Koombees of Mahratta races from the west. The results which these three tribes, Powârs, Koirees, and Koombees, have accomplished within the last two centuries are perhaps surprising; and much of the most remarkable reclamation has occurred within the last century, and some even within the last half century. Within these periods, these people have felled forests over miles and miles of country (the stumps of the primeval trees are still visible inside the houses of some villages); they have constructed wells and small tanks by thousands; tanks with broad sheets of water by hundreds, and lakes by scores. They have reared a breed of cattle not tall nor showy, but braced and knit together with sinew and muscle, and able to drag the light little carts literally almost anywhere. With these, they have penetrated the roughest localities, got across tortuous ravines, and scaled steep flanks of hills, in order to reach and break up the rich table-lands beyond, and to carry away the produce of the jungles. Even horsemen, toiling up and down these places, often wonder at finding the ruts and marks of the cart wheels. To illustrate this further, a few sentences may be extracted from an address I delivered to the chiefs of these tribes at an agricultural durbar in May last (1866):—

Remarkable instances of enterprise.

"The settlement records now showed how tens of thousands of acres of culturable land, in good situations too, were still lying waste. But the past history of the district raises the hope that the remaining waste may yet one day be reclaimed. For it is scarcely more than a century ago that all the broad flat territories below the hills now waving with harvests, were covered with forest. The work of reclamation, the beginning of which was, so to speak, but of yesterday, should still be carried on with fresh vigour."

"They should never forget the example of those who founded the prosperity now witnessed. First, Kolhoo Putel, broke in upon the wilds and wastes of Hutta and Kamptee, then scantily occupied by Gonds. He and his people cut down the massive teak and the tall bamboos to form the fields. He was followed by his son Gondee Putel, who enlarged all the villages his father had founded, and set up many new ones, and left to his heirs a really fine patrimony, stretching over many square miles, and containing hundreds of villages equal to half a modern district—all the work of himself and his father. Though they died as rich and powerful agricultural chiefs, they started with very little,—their original capital really consisting, for the most part, of their strong hands, their resolute wills, and their influence over their brethren."

"Again, Luchmun Naik, the Mahratta, was a man of the same stamp as those already mentioned. He, too, left to his heirs an inheritance of several Talooks, established entirely by his own exertions. Many of his people are still living, now prosperous landholders, though originally mere settlers, who can recount the hardships and distresses they underwent in founding their villages."

Much waste still to be reclaimed.

17. Still, however, there is in some places a vast field for increase of culture. The settlement of landed tenures and the demarcation of private from State property, being now completed, it is found, from the register of waste lands available for lease or purchase, that there are some 400 lots with an aggregate of 427,895 acres in the Nagpore district; and some 550 lots with an aggregate of 551,923 acres in the Bhundarah district—much of this area is sterile of course; but much, on the other hand, is quite fit to be reclaimed. In some parts of the country there are traces of desertion of the villages by their inhabitants in a former period, probably by reason of sickness or other failure. This may be illustrated by an extract from my report on the tramway above alluded to. In reference to the banks of the Baug river, already mentioned as one of the affluents of the Wyngunga, where the localities being unpromising and the climate insalubrious, settlers will not now venture.

"There are large tanks, dry and ruined. Expanses of ground now covered with scrubby brushwood

brushwood were evidently once covered with husbandry and tillage. As a remarkable instance may be mentioned the remains of a noble tank, once several square miles in extent. The massive dam (70 feet high) was breached many years ago; but its remains are still considerable, and its masonry sluices are still almost perfect. The history of its construction is unknown, even to tradition."

18. In the same neighbourhood also, there is a remarkable site for the storage of water, close to the alignment of the eastern trunk road from Nagpore to Chutteesgurbh. This spot was described as follows, in my Administration Report for 1862-63.

"There is a basin where a large reservoir of many square miles in area might be formed, at a comparatively trifling cost, by blocking the one outlet by which alone the waters can escape. From such a reservoir a valley containing 22 villages might be irrigated. The project has not been matured, but it is pronounced practicable by engineer officers who have seen the place. On the spot there are the remnants of materials of an unknown period, which must have been collected by some former proprietor with a view to constructing this very work."

12. In other parts of the country there are promising projects for irrigation. In my Minute on the River Pench, it was shown how (irrespective of the storage for supply of the navigable channel of the great rivers) a canal might be conducted down the fertile tongue of land between the converging streams of the Wyngunga and its affluent, the Kunhan, for a distance of 40 miles. This proposition was made on professional information obtained by Mr. Hanna. It has not yet been fully estimated for. Colonel Fife writes of it in strong terms of advocacy in his memorandum already adverted to.

Capabilities of the country for irrigation.

The Pench project.

20. Then there is a project, now professionally designed and matured, for the storing of water near Saonair, a town 20 miles to the north-west of Nagpore, with a view to conducting an irrigation canal down the valley of the Kunhan, close up to Nagpore and Kamptee, calculated to fertilise an area of some 128,000 acres. In the Kuttungee valley alluded to in the foregoing paragraphs of this Minute, there is a fair field for irrigation. It was thus mentioned in my Administration Report for 1862-63, para. 236: "The Kuttungee valley has been chiefly reclaimed within the last 50 years; is fast increasing in cultivation and population; sending its surplus strength of men to labour in the public works. Its products are chiefly grain and sugarcane. It has many small tanks, but these do not suffice to provide the permanent irrigation which is required. Now two gorges have been found with streams running down from the hills and capable of being dammed up and formed into large reservoirs, from which irrigation might be easily conducted over hundreds of villages." Since then the Kuttungee project has been matured by Mr. Hanna; a series of irrigation works can be carried on in connection with each other calculated to fertilise ultimately some 128,000 acres.

The Saonair project.

The Kuttungee project.

21. Immediately to the north of the Upper Valley lie all the best and most accessible forests of the Central Provinces, abounding in saul, saj, and other useful timber trees, which have supplied the sleepers for the railways. In the north-east are those lofty tapering bamboos (rising from 50 to 80 feet high) which love the margins of streams, whence they are floated down by water to market. On the south-east are the once abundant teak forests of Pânabârus, which, though now carefully preserved, are, for the present at least, well nigh exhausted, from the devastating expenditure which occurred years ago. These teak-logs can be floated down the Baug into the Wyngunga.

The forests in the neighbourhood.

22. The trade, partly local and partly general, in the several tracts above mentioned, is large. In my Tramway Report of 1863 it was shown to be (para. 48) as follows:—

The existing trade.

	IMPORTS.		EXPORTS.	
	Bulk.	Value.	Bulk.	Value.
	Tons.	£.	Tons.	£.
Aggregate Imports from Eastern Districts to Kamptee and Nagpore - - - - -	46,008	573,072	—	—
Exports from Nagpore and Kamptee towards Eastern Districts - - - - -	-	-	3,115	136,598
Trade between Eastern Districts and the West, not passing through Nagpore and Kamptee -	7,611	251,450	6,227	226,697
TOTAL TONS - - -	53,619	£. 824,522	9,342	£. 363,295
GRAND TOTAL - - Imports - -	53,619	- -	- -	824,522
Exports - -	9,342	- -	- -	363,295
	62,961	- -	- £.	1,187,817

Besides this there is an exportation of rice from Kuttungee to Nagpore of 13,000 tons annually. Thus the total bulk must be nearly 76,000 tons annually. The excess of imports over exports is partly made up by the large exportation of bullion from Nagpore eastwards, which is known to amount to many lakhs of rupees' worth annually. The articles entering into Nagpore from the eastwards, or passing by or near that route towards Berar, are chiefly grains, rice and wheat, together with some cotton. The articles going from Nagpore eastwards are English piece goods, cutlery, metals, oilseeds. Now all this trade passes through the upper basin of the Wyngunga, crossing both that river and the Kunhan, and is now carried by pack bullocks or country carts. The cost of such carriage was set down in 1863 at from three to four annas per ton per mile; since then, with the universal rise in prices, the rate has increased. Besides this through trade, there is a great local traffic between the towns and villages, which could not well be exhibited in returns. It may give some idea of the resources of the country to note that the municipal dues for the two neighbouring towns of Nagpore and Kamptee amount in all to about 2½ lakhs of rupees, or 22,500 £ net per annum (that is, the amount paid without any deductions by farmers who defray their own establishment for collecting); these are calculated at about two per cent. all round on articles of all sorts brought in for consumption. Thus they must represent an import trade of about 200 lakhs, or two millions sterling per annum, into these two cities, lying close together.

23. The through traffic runs, at present, due east and west, that is, at right angles to the main line of river communication running from north to south. Whatever trade there is up and down the river, is of the merest local character, and there are no lines of land traffic running parallel to the river. It were vain to speculate as to how much of the trade now flowing east and west would be diverted in a north and south direction if the river route were opened. The above facts are offered merely to show the capacity of the country for trade, and the high proportion of its surplus produce.

24. The statistics of the upper basin of the Wyngunga may be thus abstracted :—

	Revenue, including Local Funds.		Population.	Total Area. <i>Square Miles.</i>
	<i>Rs.</i>	<i>£.</i>		
District of Nagpore - - - -	15,50,000	155,000	945,600	3,750
District of Bhundarah - - - -	6,95,172	69,517	711,100	5,845
Kuttungee in Seonee District - -	76,747	7,675	87,900	1,376
TOTAL - - - <i>Rs.</i>	23,21,919	£. 232,192	1,744,600	10,471

It will have been seen that this tract is already fertile, and comparatively wealthy, and is in many respects highly improvable.

SECTION IV.—THE LOWER BASIN OF THE WYNGUNGA.

25. The lower basin of the Wyngunga may appropriately be divided into two parts: 1st, that lying on the right or west bank of the Wyngunga; 2nd, that lying on the left or east bank. Each of these will be separately noticed.

26. The tract on the right or west bank is formed thus:—Commencing slightly below Nagpore there is an irregular range of hills, chiefly sandstone, which runs southward. This is a perfect backbone to the country inclosed between the rivers Wurdah and Wyngunga. On the west of the ridge is the proper valley of the Wurdah, with its well-known cotton field and its mart of Hingunghat, which require no further notice in this Minute. To the east of the ridge is the rice-growing valley of the Wyngunga. For some distance the two rivers run comparatively parallel; but further on, the Wurdah bends eastwards a little below Chanda, to join the Wyngunga. Near the junction the ridge above mentioned is met with. The tract now to be briefly noticed is that lying on the right or west bank of the Wyngunga.

27. This tract, as already seen, lies between a low range of hills and a river, having an average breadth of 30 miles. Though partly champaign, it is yet much broken up and diversified by hills and jungles. Advantage has been taken of the undulations in the ground, and the streams permeating it, to construct a regular tank system. These are not so large as the lakes mentioned in the upper basin of the Wyngunga, but are second to them alone. It has been said in the foregoing paragraphs of this Minute, that the Gond dynasty of Deogurh (Nagpore) did not effect much material improvement. But this tract belonged to the Gond dynasty of Chanda, who, probably established at a later period, were comparatively more civilised; and these have left behind them a noble mark on the land.

In

Statistics of the
upper valley.

The west part of the
lower valley.

Its tank system.

In 1865, after visiting these tanks, I caused a letter to be written to the local authorities, which, as it conveyed impressions on the spot, may furnish a few extracts to make up the description, as follows:—

“The number and size of these tanks is certainly remarkable. In some parts they even cluster thick round the feet of the hills. From the summit of the hill, called ‘Pêzagurb’ by the Gonds, and ‘The Seven Sisters’ by the Hindoos, no less than 37 tanks were counted as distinctly visible.”

“These tanks are indeed the pride and ornament of the district. They are, as the people themselves told the Chief Commissioner, the very life of the place. They are the object to which much of the industry and capital of the people are devoted, and are the main source of agricultural wealth. The two staples are rice and sugarcane, and both are entirely dependent on the water supply for irrigation from the tanks. Not only have large, indeed sometimes very extensive, sheets of water been formed by damming up streams by heavy earthwork dykes; but masonry escapes, and sluices, and channels, have been constructed. Some of the sluices, as head works for irrigation channels, present an almost elaborate apparatus, creditable to the skill and ingenuity of the people.”

“With many, perhaps with most, of the largest tanks, the works were in good, even capital repair.”

28. This tract, though possessing much of agricultural resource, especially in respect of sugarcane and rice, has not many towns or centres of resort. The only place worth naming is Berhampooree, where there are some fine cloth manufactures. Also near “The Seven Sisters” hill, already mentioned, quantities of iron ore are dug out from the surface. Day and night the fires of the smelting furnaces blaze in the midst of the wilderness. This ore is dispatched to considerable distances. Many specimens were sent to the Nagpore Exhibition, and contributed to make up what qualified judges considered a good collection. The iron ores.

29. The second tract, lying on the left or east bank of the Wyngunga, may be described as a vast wilderness, thinly dotted with hamlets, occupied by primeval races, and ruled by uncivilised chiefs (called zemindars locally) under British control. The only exception is this, that all along the river bank there is a strip of cultivation and habitation containing many fine villages, and some towns. The eastern part of the lower valley.

30. The zemindarees or chiefships above mentioned are the backwoods and the bush. Most of the chiefs own a sort of allegiance to the zemindar of Pânabârus, who is himself, however, nothing more than a denizen of the wilds. They have an area of many hundreds of square miles, ninety-nine hundredths uncultivated, much of it hilly and sterile, but much of it culturable. This area stretches backwards, that is eastwards, till it touches the limits of the Bustar State, where Marees and other real savages live up in trees. It has, of course, boundless forests of the usual sorts of timber trees, but not any forests of very marked character, save those of Pânabârus already mentioned in the foregoing paragraphs of this Minute. Its chief value at present arises from that large class of miscellaneous articles—drugs, dyes, pigments, fibres, and the like, ordinarily classed as “jungle produce.” These are collected in quantities at the marts, and thence exported to great distances. The wild chiefships.

31. The only other place worth noting is the hill of Soorjagurh, recently described by Lieutenant Brooke, of the Settlement Department, from whose report the following extracts may be made:— The Soorjagurh hill.

“Next morning, the 21st, guided by two Maree Gonds, I started to climb Soorjagurh. After crossing two smaller hills, we arrived at the low hill, and commenced the ascent. On the top comes a cluster of huge boulders. This is cut into two parts in the middle cleanly, as if with a knife. On getting to the foot of the rock, the Gond guides refused to go any further, dreading the vengeance of the god, and swore most lustily that there was no road or way up, and that no one ever went there. However, I began to climb, and in about a quarter of an hour of hard scrambling up the face of the rock, reached the summit. The day was unfortunately cloudy, rather restricting our view, which must in clear weather be very fine; as it was, we could see an immense distance—all, however, an ocean of the jungle, dotted at long intervals with Gond hamlets. My aneroid gave the height as 1,685 feet above the village, which itself is 375 feet above the level of the Wyngunga. This would make the mountain more than 2,000 feet higher than the plain. On the top is a Gond god, and the remains of an old building or fortification round the edge of the rock.”

32. In the cultivated strip along the river bank the following towns deserve to be named, as being of either past or present importance; though the utter inferiority of the dwellings, constructed entirely of poles (they cannot be called wood) and grass, show the low state of the civilisation in this locality. First comes Armoree, a town of some 10,000 inhabitants, and is the entrepôt for the trade between the wild states and the rich districts of the west. Here are collected the articles already explained as jungle products from Bustar and all intermediate states; and the small supplies of foreign (even English) piece goods, of cutlery, of cotton thread, and the like. Near this is Wyragurh, a fine estate, but a broken-down place, with a large ruined masonry fort, erected and kept up by the Mahrattas to overawe the chiefs already mentioned, but now quite abandoned, and no longer wanted under the altered aspect of the times. The towns of Armoree and Wyragurh.

The Khandeshwur
iron-mines.

33. Lower down the bank there is the iron hill of Khandeshwur, which, rising from a broad basis of ferruginous rock, lifts up its peaked head, black and grim, to a height of 200 feet. From the foot of this remarkable rock, impregnated with excellent iron ore, the people have for ages past dug and carried off the materials for the smelting furnaces in the neighbouring villages. The ore is not worked up on the spot, but is sent in crude lumps to many places all over the country. The late Mr. Hislop (an excellent authority) examined this place in 1860-61, and considered it to be quite the best, and richest in the requisite ingredients, of any ores he had seen in these provinces, and that this was quite the best place of the kind for European enterprise. The specimens sent to the Nagpore Exhibition in 1865 were highly thought of by the scientific examiners. It is manifest that a valuable item of traffic might spring from this place, in the event of the navigation of the Wyngunga being opened.

The towns of Gurh-
choorolee and Cha-
moorsee.

34. Next (following the river course) there comes Gurhchoorolee, and then Chamoorse. These are towns of some thousands of inhabitants each. They have some trade similar to that of Armoree; but their speciality is this, that they are the depôts for the salt which comes by land routes of hundreds of miles from the eastern coast districts of Ganjam and Vizagapatam, first to Sironcha and the Godavery country, and then on to this, the lower Wyngunga country. The salt is brought by the carriers of the Bunjara tribe, in bags thrown across the backs of bullocks, in droves of hundreds. The wonderful organisation of these bullock caravans (second only to the camel caravans of the north) has been described in my Administration Reports; and it will suffice here to add, that in these two places the Bunjara system is to be seen in its natural and original state. The quantity of salt annually passing by these points amount to 30,000 maunds, or 1,111 tons.

The salt import.

The new Imperial customs cordon passes from Chanda, thence to the junction of the Wurdah and Wyngunga, and then turns northwards, passing through Chamoorse and Gurhchoorolee on to Wyragurb, and strikes off eastwards towards Chutteesgurh. The future salt trade has always been an item in the calculation of the probable traffic of the Godavery; and it will now be evident that the opening of the navigation of the Wyngunga in connection therewith will impart an impulse and an extension to the consumption of this necessary article.

35. In the rear, that is to the east of all these places (Armoree, Wyragurb, Gurhchoorolee, Chamoorse), there may be seen many square miles of flat culturable waste, the soil being of a light character, but fit to produce rice and suchlike things.

The Ahiree chief-
ship.

36. At and near the confluence of the Wurdah and Wyngunga, and along the left bank of the Pranheeta (which river commences from the confluence), the tract belongs to the chief or zemindar of Ahiree. Here again the quantities of fair culturable waste, now clothed with luxuriant brushwood, astonishes even those accustomed to see the unreclaimed expanses of these provinces. And inasmuch as these particular wastes are comparatively near to a populated country, the extent to which cultivation might spread along the margin of the river, in the event of its navigation being opened, is indefinite. Ahiree is noted for its teak forests, situated at some distance inland from the river, which were mentioned in paragraph 68 of my Godavery Report.

The existing trade.

37. In the lower, as in the upper, basin of the Wyngunga, the current of existing trade sets in from east to west, for the most part being at right-angles to the course of the river from north to south. From the registration returns the trade may be abstracted thus:—

	IMPORTS.		EXPORTS.	
	Tons.	£.	Tons.	£.
Aggregate Imports from countries east of the Wyngunga, that is eastern coast districts, parts of Chutteesgurh, and the Bustar State - - - - -	1,500	47,060	-	-
Aggregate Exports from countries lying west of the Wyngunga to countries east above mentioned - - - - -	-	-	9	173
Tons - - -	1,500		9	

TOTAL Imports and Exports - - - £. 47,233.

38. The trade of this tract, however, has not by any means reached its proper growth, being half stunted from the want of adequate communication either by land or by water. There is not one made road in this tract, and apparently years must elapse before there can be the means of attempting such a work. The above figures, therefore, can only give some dim notion of the capacity of the country for trade, if communication could only be opened. Meanwhile, the strings of pack bullocks cover the line of march through the wilderness literally for miles together; and the rustic folk hold periodical fairs in the lengthening shadows of rocky hills, or under the natural canopies afforded by the trees of the forest. Such a fair is that held at frequent intervals near the iron-mines mentioned in the foregoing paragraphs.*

paragraphs.* There the rude ironmongers bring their bulky wares, and take away the fine fabrics and piece goods from Nagpore, and there I have seen English cloths, with Manchester labels all correct, exposed for sale.

39. The general statistics of the lower basin of the Wyngunga valley may be thus abstracted:—

Statistics of the lower valley.

				Revenue, including Local Funds.	Population.	Area.
					Souls.	Square Miles.
Berhamporee Sub-Division of the Chanda District	{	Rs. £.	1,43,263 14,326	}	142,000	1,905
Mhool - ditto - - ditto - - -	{	Rs. £.	1,52,326 15,233	}	130,605	1,952
TOTAL -	{	Rs. £.	2,95,589 29,559	}	272,605	3,857

SECTION V.--STATISTICS OF THE WYNGUNGA COUNTRY.

40. The statistics, then, of the whole Wyngunga country, as thus described, may be summarised as follows:

Extent of the Wyngunga country

		† Revenue, including Local Funds.		Population.	Area.
		£.	£.	Souls.	Square Miles.
Upper Basin - - - - -		23,21,919	232,192	1,744,600	10,471
Lower Basin - - - - -		2,95,589	29,559	272,605	3,857
TOTAL - - - Rs.		26,17,508	£. 261,679	2,017,205	14,328

41. This represents a really considerable portion of territory already possessing strength and resources, and even some wealth; but capable of becoming much greater, traversed from end to end by a great river, by whose affluents, too, it is threaded in every direction; but still destitute of any through water communication whatever: having roads indeed in the upper portion, but devoid of any proper land communication in the lower.

42. In comparison with the above figures, it may be well to give the same statistics for the Wurdah valley.

compared with the Wurdah country.

		† Revenue, including Local Funds.		Population.	Area.
		Rs.	£.	Souls.	Square Miles.
Wurdah Valley - - - - -		8,90,881	89,088	304,600	2,360

This area comprises the great cotton field; whereas the Wyngunga produces some, but not much, of that article.

43. It will hence be seen that the country of the Wyngunga is very much larger than the country of the Wurdah, and, save in the one item of cotton, much more important. Indeed, the revenues of the Wyngunga country are nearly three times as great as those of the Wurdah country; and the population of Wyngunga country is five times as great as that of the Wurdah country. It must be added, however, that some of the Wurdah country being

* The precise spot is named "Jumulghatta."

† Excluding Salt Customs.

being in Berar and in the Nizam's dominions, does not come into this calculation. If it could be included, it would slightly reduce the balance of the comparison against the Wurdah. But even after abatement for this, the Wyngunga is far the greater river, and its basin by far the richer and larger of the two.

The capacity of the Wyngunga compared with that of the Wurdah.

44. Further, it is noticeable that, excluding the Pyngunga, which is an affluent of the Wurdah, and which enters the Wurdah within the last 50 miles of the course of that river, the Wyngunga is a much larger river than the Wurdah. The Pyngunga is indeed a river of some length (*see* paragraph 5 of my Godavery Report of January 1863); but then it is entirely, from source to mouth, within the Nizam's dominions; and however improbable it may, or may not be, still its improvement is beside the present question. Whereas the Wyngunga is entirely a British river in British territories. Exclusive of the Pyngunga, then, the capacity of the Wurdah may be compared with that of the Wyngunga, according to the subjoined table which has been compiled by Mr. Hanna from generally reliable maps, and in which the quantities of volume and discharge are deduced by a formula approved by Colonel Dickens. It will be perceived that the Wurdah has, in round numbers, only one-half the length, and one-third the capacity of the Wyngunga, and drains only one-third of the area of country. In other words the Wyngunga is in all respects to Wurdah as three to one.

Name of River.	Length of Main-stream from Source to Mouth in British Miles.	Aggregate Length of Principal Branches.	Aggregate Mileage of Main-stream and Affluents.	Total Catchment Basin in Square Miles.	Volume of Water Annually Discharged in Cubic Yards.	Approximate flood Discharge near Mouth in Cubic Feet per Second.
Wyngunga - - - -	325	330	655	25,500	55,555 millions	1,642,700
Wurdah - - - -	200	140	340	8,500	18,518 millions	730,321

SECTION VI.—THE EXISTING BOAT TRAFFIC ON THE WYNGUNGA.

45. As already mentioned in the foregoing paragraph 7 of this Minute, there is already a boat traffic on the river, of a local character only, from place to place, but not any through traffic from end to end. It will be desirable to examine this point a little closer.

The boat traffic within the Bhundarah district.

46. Captain Newmarch, the Deputy Commissioner of Bhundarah, in a recent report writes thus:—"There is a certain amount of local traffic on the Wyngunga in this district during the monsoon, and this is entirely carried on dongas or large logs of teak scooped and hollowed out. This traffic tends from north to south, and is chiefly directed towards Bhundarah. It consists almost exclusively of grain, and is dependent on the comparative cheapness and greater productiveness of the northern part of the district. The dongas employed vary in size, but the average freight is about 30 and 35 maunds ($1\frac{1}{2}$ ton). The carriage is cheap, being on an average about three-fourths of a pie per maund (or $2\frac{1}{2}$ d.) per ton per mile, including all charges. And as at this particular time of year transport by carts is most difficult and expensive, the river route offers great advantages. For the registration of the boat traffic this year, four posts were established; and an abstract of the traffic for July and August 1866, with an estimate for the remaining three months of the season is herewith annexed. The season commences in July and lasts till the end of November. There is no traffic upwards against the stream, and the four places where the posts are established are the chief points where bulk is broken. Bhundarah absorbs three-fourths of the traffic, while Pohonee has only a very small share, on account of the difficulties of the Tiddee (or Muggurdokra) barrier. The trade consists almost entirely of grain, and as the present estimate is rated low, may be fairly considered to represent an average value of 50,000 rupees during the season."

Its existing amount.

47. the Abstract Statement of the existing traffic may be rendered thus:—

Abstract of Traffic from North to South.	Wheat.		Rice.		Other Grains.		Oil Seeds.		Miscellaneous Articles.		TOTAL.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	*Maunds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.
Actual traffic in July and August 1866.	188	750	4,779	14,337	2,126	6,378	69	254	184	1,811	7,346	23,530
Estimate of probable traffic in September, October and November 1866.	212	850	5,021	15,063	2,074	6,022	51	256	166	2,089	7,524	24,280
TOTAL - - -	400	1,600	9,800	29,400	4,200	12,400	120	510	350	3,900	14,870	47,810

* Of 82 lbs. per maund.

Hence

Hence the total existing traffic may be said to be some 15,000 maunds (550 tons), valued at 50,000 rupees (5,000 £), for the season from July to November.

48. In the Chanda District Captain Lucie Smith, the Deputy Commissioner, reports: "During the rains a few boats laden with wheat and pulses come from Pohonee past Armoree to Chamoorsee" (a distance of about 75 miles). The boat traffic within the Chanda district.

49. These amounts may not be large, but then it will be seen that even the local traffic is much curtailed and restricted, by the existence of one bar in the main river, one in the affluent of the Kunhan, and one in the affluent of the Baug; and owing to the barrier near Muggurdokra, and the still greater barrier down south, there can be no through traffic at all; but from the facts as they are, it is possible to conjecture how great, how beneficial, this boat traffic might become if the greater barriers and the lesser bars can be removed or overcome by engineering skill.

SECTION VII.—THE BED AND STREAM OF THE WYNGUNGA AND ITS AFFLUENTS.

50. It were, perhaps, superfluous to premise, that obstructions in the channel are of two kinds; namely, those which hinder navigation in the wet season of high water for some five months; and those which hinder navigation in the dry season of low water during the remainder of the year. In the former case, the boatmen disregard all the lesser sunken rocks, stones and shrubs, and lose sight altogether of the little rapids; but fear the fierce current of the rushing volume of water, and the protruding tops of rocks against which they may be thrown, and the points of trees and stones rising close up even to the elevated surface of the water, upon which their boats may capsize or founder. In the latter case they disregard the uplifted rocks or the large trees, which, while moving in quiet water, they can easily avoid; but they are stopped by the tangled meshes of brushwood, and the congeries of lesser stones, so closely packed or jammed together, that their boats can neither pass over, nor through, nor find practicable egress. Thus it is, that some obstructions which are formidable at one season, are of no consequence at another, and *vice versâ*. At the great barrier near the mouth of the Wyngunga, where, in the dry season, we failed to make a boat go at all, the boatmen said that at high water they floated over securely. At the lesser barrier, near Bhundarah, where at flood level the violence of the water is said to be so terrific that no boat could live, we passed down, during the dry season, in a boat amidst scenes that were placidly picturesque. It may be convenient to bear this distinction in mind during the following brief description of the bed and channel of the river. Varying character of the obstructions.

51. Most of the description now to be given is derived from what I myself saw in the driest season (the last days of May and the first days of June 1866). The local information was obtained at the time and on the spot, from the inhabitants, by Captain C. B. Lucie Smith, the Deputy Commissioner of the district; but it should be added, that Mr. E. de Gronsilliers, Executive Engineer, accompanied by Mr. Farley, of the Transport Department, descended the river from Kamptee, near Nagpore, to the confluence with the Wurdah, at the end of September and the beginning of October 1861, in four "sangadies" (canoes) which had been hired and housed over for the purpose. Mr. de Gronsilliers made an official report of this voyage, from which quotations will be given now, and which (at least that part which pertains to the Wyngunga) will be appended *in extenso*. Mr. de Gronsilliers report.

The distances of the river course are taken with approximate correctness from the old topographical survey map prepared by Messrs. Norris and Weston, and re-published by the Surveyor General of India.

52. This description may be best commenced from the lower portion of those rocks which, studding the bed of the stream from a point between Dewulmurree and Ahiree, and thence upwards to the junction of the Wurdah and Wyngunga, and beyond that to near the village of Durroor on the Wurdah, a total distance of 30 miles, are commonly spoken of as, and now officially designated, "the third Barrier of the Godavery." In reality, however, the local name of the river, formed by the confluence of the Wurdah and Wyngunga is the "Pranheeta."* The Pranheeta barrier.

53. A short distance above Dewulmurree there begins a series of jet black rocks, edging the main stream of the river, more particularly the left or northern side; they do not form a continuous wall, but rise up in piles, sometimes pyramidal; these separate blocks are close together, and much in the same line; they are several in number, perhaps 12 or more, and stretch for half a mile or upwards. I looked at these in company with Captain Lucie Smith, the Deputy Commissioner, and we judged them to be, at their highest points, from 15 to 20 feet high, above low-water level. Beneath them the water flows smooth, and we passed up and down it in a boat; behind them, to the main land, there stretches an expanse of boulder and rank brushwood in such confusion as to baffle description; this expanse must be mostly submerged in the flood season, but the points of the piles of rock above specified must protrude. As the floods come down, the people say, that the dash of the water against the rocks, flinging and tossing the spray about, is grand. The Ahiree chief informed me, that no boat ever tried to pass this place in the flood season, and that he would not try it for fear of his life. This place, which is the first obstruction to those going up, or the last to those going down, is, so to speak, the pinch of the case, and among the very The rocks near Ahiree.

* "Pranheeta" is the Teloogoo for "River of Life;" that being the language of this part of the country. O.G. A A 2

very worst parts in the whole barrier ; it may be distinguished by name as the Dewulmurree rocks. The scene is one of interest, perhaps even of beauty. Above this, for a short distance, up to near Choonchgondee (opposite Ahiree, which lies a little inland), it is possible in the dry season to go in a boat, and doubtless would be practicable in the wet season ; but even the boat winds its way amidst sand, and rocks and islets, all which obstructions increase as the village of Boree is approached.

The obstructions
near Boree.

54. Near Boree, about eight miles above Ahiree, the river is quite impassable for boats of any description during the dry months ; the bed of the stream is, to a great extent, blockaded with rocks, some of which are from 10 to 15 feet high. During the rains, when the floods are high, the rocks being nearly all submerged, large boats can be passed over ; the only difficulty being the velocity of the current when the freshes are at their height, which is sometimes so severe that boats going up the stream are obliged to defer their onward course until the waters have somewhat subsided ; but then the points or peaks of the rocks protrude, and cause a new trouble to boats going down. Above Boree, the rocks, though very numerous, are of a less formidable character for about two miles ; when near the hamlet of Teekapullee they again increase in extent and numbers, and form an almost unbroken bar from bank to bank athwart the stream. This place is impassable during the dry months, but during the floods the rocks are submerged, and the passage of boats unobstructed.

The rocks near
Mareygaon.

55. About nine miles further up, near the village of Mareygaon, the rocks again rise to a considerable height, and form one of the most critical points even during high-water season. The inhabitants give an imposing account of the collision of the floods descending upon the rocks about here, and of the eddying whirlpools.

56. Approaching the junction of the Wurdah and Wyngunga, the Pranbeeta gradually becomes wider. At the junction itself there is a breadth of fully one mile, subdivided into a network of small streams by innumerable ridges and piles of rocks, and with several islands, the whole forming a sort of labyrinth.

57. In the Wurdah (above the confluence with the Wyngunga) the rocks continue for some seven miles, but are not of a particularly troublesome character till the formation of rock is reached, which was proposed as a site for an anicut, as being on the upper crest of the barrier. The distance from the rocks above Dewulmurree to the confluence of the Wyngunga and Wurdah is 23 miles, by river course, leaving seven miles more to Durroor, up the Wurdah ; in all 30 miles, constituting what is known as the "Third Barrier of the Godavery."

58. The foregoing remarks apply to the Pranbeeta, and not to the Wyngunga proper. The following remarks will refer to the Wyngunga itself.

The mouth of the
Wyngunga.

59. At the junction the Wyngunga is three-quarters of a mile broad, with several deep pools. The water is still and blue ; the stones have varied hues, and the scene is picturesque. People are ferried across in the dry season. The banks on either side are flat, and of earth fairly well defined, and 20 to 30 feet, some times more perhaps, above the low-water level. The village here is named Koongara. Immediately above the junction the rocks in the Wyngunga are not so numerous, but sometimes they rise in scattered pieces several feet high, and sometimes sunken points are met with a few inches below the surface of the water.

60. About three miles above Koongara, and a little below the village of Ashtee, the river is very shallow, and blocked up by a ledge of rocks over which not even the smallest country boat can pass during the dry months of the year, the river escaping through chinks and crannies. From Ashtee on to the village of Kurroolee the banks become rocky, but in mid-stream there is a good channel of water on which the boats of the country ply all the year round, from one village to another. About a mile above Kurroolee, opposite to the village of Yenna, on the right bank, the passage is again closed in the dry season by thick banks of low rocks through which the water drains in minute streamlets.

The island of
Koorta.

61. Two miles above the lower boundary of these rocks the river is divided by the cultivated island, on which is situated the village of Koorta.* Of the two streams running, one to the east and the other to the west of the island of Koorta, the latter is narrower and never navigated ; the former, at present the main stream, though by no means good, is just passable.

The main stream.

62. To within one and a half miles of the village of Koorta the bed of this main or east stream is thickly strewn with rock, the tops of which are about eight or 10 feet above the water in the dry season. During the floods these rocks are submerged, and country boats pass up and down the stream with some difficulty. But in other seasons of the year, owing to the narrowness of the channels, it is only just possible to float a single boat, lightly laden, from above the rocks at Koorta down to Kurroolee. From Koorta onwards to Ghatkool, and for a mile or so beyond that, the stream is comparatively free from rocks, and, though very shallow in places, is more or less passable at all seasons of the year. In fact, opposite Ghatkool, there is a sort of pond in the river.

63. In

* The morning I visited the lower tongue of this island, the footprints in the sand showed that a tigress and cubs had just been down to the water to drink.

63. In the lesser or west stream, from the commencement of the open water above Kur-roolee, the bottom is almost paved with rocks, which, continuing to within five miles of Ghatkool, terminate abruptly in a wall-like barricade several feet high, through which one can hardly understand how the water squeezes its way; it must percolate through crevices. Above this stony bar is a beautiful deep pool, which stretches about half a mile northwards. The branch then, up to its junction with the main stream, about a mile below Ghatkool, becomes extremely shallow, and in some places is all but dry in the hot months.

The side stream.

64. Near the head of the Koorta island the stream which flows past Mhool joins the Wyngunga, but is quite dry during the hot months.

65. At Ghatkool we may pause for a moment to note that from thence to Ahiree country boats do now go year by year, backwards and forwards, carrying produce. The traffic is as yet small, perhaps a few boats in a month, during the high-water season, and the boatmen sometimes meet with dangers and troubles; and, altogether, the service is one that required some nerve and skill. Again, boats and canoes are made at Ahiree (excellent timber being procurable there) and are thence sent by water in flood time to various places up the river. These go unladen, and can get over difficulties where laden boats could not venture; and thus they penetrate up river beyond Ghatkool. But, for anything like traffic, Ghatkool is the upper terminus of this section. Ahiree too is the lower terminus of this section; for, so far as I can make out, no boatman will face those rocks just described, between that place and Dewulmurree. In the low-water season, however, no boat can even creep along the channel, the hindrances are so interminable throughout this section.

Boat traffic between Ghatkool and Ahiree.

66. Above the Koorta island, and near Ghatkool, the Wyngunga becomes again one stream, and so continues for about a mile above Ghatkool. Then rocks re-appear, but are more scattered than those heretofore mentioned.

The Wyngunga off Ghatkool.

67. Then the river again bifurcates and forms the island on which are situated the villages of Larolee and Joongaon, and which may be distinguished by the name of Larolee island. That part of the stream which passes to the east of the island is the largest and the best. But even then it is bad enough. There is a fall about here of $13\frac{1}{2}$ feet in three miles.* The water sometimes rushes over the jutting stones in little rapids, and sometimes collects in deep holes. Sometimes, again, small trees or strong bushes grow out of the rocks, and trouble the navigation. In the dry season I had difficulty in crossing this place on an elephant, and a boat could, probably, not have got up and down at all. In the flood season, however, boats might possibly pass. At the time when I saw it, the river about here had a depressing and forbidding aspect. The scene was one of horrid desolation, where malarious exhalations continue during the greater part of the year.

The island of Larolee.

68. The branch of the river which passes to the west of the island is quite dry in the hot months, and is so blocked up with rocks many feet high as to be awkward for navigation even during the floods.

69. Above the head of Larolee island is the village of Kurrungaon. The channel is somewhat better, though it twists about in a maze of stones at low water; yet the floods would carry boats over these troubles. But higher up, off the village of Borghat, there is a bad piece with a fall of $13\frac{1}{2}$ feet in $1\frac{1}{2}$ miles, according to Mr. De Gronsilliers; and further up there is a rapid marked by him, with a fall of five feet in about a mile, near the villages of Kowtee and Pardee.

70. From the confluence then up to Kowtee, a distance of 30 miles (by river course), I should reckon the first or lower barrier of the Wyngunga. For all that distance the bed is almost covered with rocks, causing a continuous obstruction to low-water navigation, and rendering even high-water navigation precarious and not free from danger. In Mr. De Gronsilliers' words, it may be called "a continuation of the third barrier" (of the Godavery).

The first or lower barrier of the Wyngunga.

71. From Kowtee onwards to Chamoorsee, a distance of eight miles, the channel is, in parts, better; there is more of sand, and the rocks are at much longer intervals. At one point near Chamoorsee there is a low ledge of sandstone almost athwart the stream, on the high bank of which are built the fine old Markundah temples. The rock, though known to antiquarian tradition, is not such as to afford an obstruction. There is a slight rapid, marked by Mr. De Gronsilliers, just above Chamoorsee (six feet fall in two miles), between the villages of Arumba and Kurrelee.

The river of Chamoorsee.

72. Above Chamoorsee there is some local navigation, as will be seen presently. But below Chamoorsee down to Ghatkool (a distance of 23 miles by river course) there is no local navigation; indeed this section is a regular break or gap. As a competent native witness deposed at Chamoorsee, "Boats very seldom go south of Chamoorsee in consequence of the difficulty of navigation." This statement applies only to the piece between Chamoorsee and Ghatkool. Again, another native witness deposes, "Between Chamoorsee and Ghatkool the navigation is difficult, by reason of the high rocks and large trees growing in the bed of the river." Exceptionally, Government ferry boats, made at Ahiree, are brought up thence past Ghatkool, on to Chamoorsee, and thence further up the river.

The break in navigation between Chamoorsee and Ghatkool.

Government ferry boats.

Captain

* According to Mr. De Gronsilliers.

Captain Lucie Smith observes that "the passage of these boats proves that, under favourable circumstances, double canoes can be taken all the way up the Wyngunga." This is very true; but in practice the thing is not done in the interval between Ghatkool and Chamoorsee, save with unladen boats specially despatched and cared for.

73. Though the crest of the barrier may be considered as beginning from Kowtee, eight miles lower down stream, yet as Chamoorsee is a well-known place, it will be easier to count the lower barrier of the Wyngunga as being between Chamoorsee and the confluence.*

The first or lower reach of the Wyngunga.

74. From Kowtee, eight miles below Chamoorsee, past Gurhchoroolee and Armoree, to Pohonee (and indeed further on to Ambora), a distance of 103 miles by river course, there stretches what I would term the first or lower reach of the Wyngunga. In this section the bed is generally free and unobstructed, the average breadth being about one-third of a mile or 600 yards. The banks on either side are of earth, fairly defined, not high, perhaps from 20 to 30 feet in height, though sometimes lower, and flat at the top; in the dry season there being a broad expanse of sand with one or more channels meandering in the midst; in the wet season an equally broad flood flushing from bank to bank, sometimes even overtopping, and causing backwaters. There do occur, however, some occasional difficulties (they can hardly be termed obstructions) to navigation, either from rocks or from slight rapids. One such occurs off the village of Dubgaon, another off the village of Chiklee, nearly opposite Gurhchoroolee. These were observed by Mr. De Gronsilliers at low water in October 1861. The native boatmen also depose to there being two rocky places between Gurhchoroolee and Chamoorsee. Then near Armoree, between the villages of Soonee, Oogara and Peepulgaon, there are rocks more or less dispersed over the channel. Several of these latter I saw myself. Captain Lucie Smith also writes that, in April 1866, he went down that section of the river which is opposite Armoree in a double canoe, and he observed "several large rocks standing boldly out of the water." Immediately opposite Armoree there is a regular boat ferry, and a fine pool where fish are netted in quantities. From the village of Peepulgaon to the town of Pohonee it is plain sailing, and Mr. De Gronsilliers pronounces the river here to be "pretty clear." There is a small traffic by water carriage between the towns of Chamoorsee, Gurhchoroolee, Armoree, and Pohonee, all which, as will be remembered from the previous sections of this Minute, are flourishing places along the river. This boat traffic is merely local, and carried on in those months when the water is tolerably high, and without difficulty, according to the depositions of the traders and boatmen. It is in this section that the River Choolbund joins in.

Rocks near Armoree.

Obstacles between Pohonee and Ambora.

75. Above Pohonee the river continues clear, though the water is shallow for several miles, or as far as the village of Ghosee. At this point Mr. De Gronsilliers, passing down in October 1861, observed that a "ridge of rocks stretches from bank to bank, with two narrow shoots through them." A few miles further on he remarked that between the villages of Soondur and Kurraie "the river is literally strewed all over with rocks." This is seen at low water. At high water boats are wafted securely over these stones. Mr. M. Low, the Deputy Commissioner of Nagpore, and one of his assistants, Mr. J. Nicholls, passed down to Pohonee in August of this year. They report that "we met with no rocks; there were some isolated peaks here and there, but not in the channel of the stream. The current ran fast and very easily all the way down."

76. A short distance further on occurs Ambora. Up to this point, from below Chamoorsee, the river's course has been through a flat country. But at Ambora low hills occur, with regular rocky formations in the channel, and the scenery becomes fine. The first reach reckoned already from Kowtee below Chamoorsee to Pohonee (83 miles), may more correctly be reckoned as extending past Pohonee, or to the foot of the Ambora hills, 20 miles further on, in all 103 miles.

The second barrier of the Wyngunga.

77. From Ambora to a village named Mugurdokra† occurs what I would term the second or lesser barrier of the Wyngunga, extending over a distance of five miles.

78. At Ambora Mr. De Gronsilliers observed that "ridges of rocks run right across the river, and leave only narrow shoots for small boats to pass through." I have myself seen this place at low water. One of these ridges has a striking appearance; at first sight it seems to be an anicut or artificial weir; on a nearer view it looks like a black hog's back. Mr. J. Nicholls (in 1866) thus writes of the spot at high water: "We came across another ledge of rocks close under the Ambora hill; we had no difficulty whatever." A short distance above Ambora is the well-known pond of Tiddee, where quantities of fish are caught and sent to Nagpore and Kamptee. Above Tiddee, the river winds through rocks to Mugurdokra. Of these Mr. De Gronsilliers observes:—"The large masses of rocks we encountered were near Mugurdokra; they extend for about half a mile, and have at present no practicable passage between them." This was at low water. Mr. De Gronsilliers must, however, have got round them somehow. I certainly myself went down this part in a boat during

* Mr. De Gronsilliers would apparently consider the barrier as commencing further up, that is from Gurhchoroolee; but as inquiry shows that there is water traffic between Gurhchoroolee and Chamoorsee, I have reckoned the barrier as beginning from below Chamoorsee only, and even that makes the barrier to be little longer than it really is.

† The meaning of the name is Alligator's Pool.

during the dry season. There was throughout a channel to be found quite navigable for small boats at that season; but we wound about among rocks, which sometimes looked like little towers and pyramids, sometimes like walls and buttresses, and often rose to a height of 20 feet. My clear impression was that, about here the obstacles to navigation would be dangerous and critical at high water, and that any boats which might venture there in the freshes could hardly escape the alternative of either Scylla or Charybdis. Captain Fraser, of the police, marks opposite Mugurdokra "great danger." Mr. Nicholls writes, "We could hear the hoarse surging of the water over the rapids of Mugurdokra, when we were two miles off the place." Just below (about two miles) Mugurdokra, the Kunhan river joins in, near the village of Gond Peepree. Here also are rapids and whirlpools, of which the roar can be heard for a long distance.

79. It is, however, remarkable that, breaking off on its left bank from a point just above Mugurdokra, the Wyngunga is cutting for itself a channel which goes round all the rocks and rapids of Mugurdokra and Gond Peepree, and runs into the Kunhan close to its confluence, thus making a sort of natural canal round the worst part of the barrier, much in the same way as an artificial canal is made. This may turn out to be a providential circumstance for navigation. Mr. Nicholls writes:—

"We avoided the danger, and missed the scenery, by leaving the Wyngunga and going down a very narrow but swift channel which the river is cutting gradually for itself into the Kunhan. In the channel the banks appear to be of a soft gravelly deposit, and of considerable height. I have no doubt but that eventually the main stream will join the Kunhan by this way, instead of precipitating itself over the rocks at Mugurdokra. This passage of the Wyngunga, till we reached the deeper bed of the Kunhan, with its still water, could not have been less than two miles, and I should calculate the total fall at several feet."

Mr. Low writes that at this point (near the junction), the passage of the Kunhan was safe, without any risk. This remarkable side passage must be from comparatively recent erosions, as it is new, and not marked in any of the maps. Thence, from the confluence of the Kunhan, down to Pohonee, Mr. Nicholls appears to have swept along past Ambora on the flood currents down to Pohonee, without meeting any obstacle whatever.

80. Above Mugurdokra, and five miles south of the town and station of Bhundarah, the second or upper reach of the Wyngunga may be reckoned. Here the dimensions of the river are imposing. Mr. Nicholls thus describes it, in August 1866:—"We started about noon, not on the river itself, but from a lagoon connected with the river. As it opened out, the sight was very striking. The broad bed, full from bank to bank, and the current running with great velocity, an uninterrupted volume of water above 700 yards or half a mile wide. We were taken by the stream at the rate of about six miles an hour." This reach extends, without let or hindrance, past Bhundarah, past Moharee and Toomsur (the large grain marts), past the mouth of the Bawunthurree, the mouth of the Choonee, and the mouth of the Baug, and past the town of Hutta, up to a point between the villages of Peepree and Cheezgaon. Along this length of 60 (sixty) miles by river course, there is already local traffic by country boats, which ply for several months of the year when the channels are sufficiently full, without meeting any obstruction whatever.

81. At the point between Peepree and Cheezgaon there is an obstruction from rocks, probably the basement of a detached hill hard by, which, though it stops the boat traffic just now, can hardly be styled a barrier in comparison with the places previously considered in this Minute. This spot was examined by the Deputy Commissioner, Captain Newmarch, in 1865, who reports the rocks to be rugged, and to extend for some little distance. He has had some experience in the blasting of rocks on roadways, and seems to consider that this obstruction might be removed with a very moderate outlay.* If it were removed, he justly observes that the Wyngunga would be navigable from the limits of the Mundla District, that is, from the foot of the Sautpoora Range, some 20 (twenty) miles further. This being counted as an intermediate obstruction only, the second navigable reach of the Wyngunga may be said to stretch from below Bhundarah to the foot of the Sautpoora Range, a total distance of 85 (eighty-five) miles.

82. To this general account of the channel of the Wyngunga, it must be added that there is no exact information as to the slope of its bed, no complete levels having yet been taken. Major Haig supposed this to be about $2\frac{1}{2}$ feet per mile (which is much greater than that of the Godavery, generally 1 foot per mile). Judging by the eye, I should apprehend that the Wyngunga has a quicker stream than the Godavery. According to Mr. Hanna, there is a difference of 438 feet in level between the Kunhan and the confluence of the Wyngunga and Wurdah, a distance of 200 miles, which gives an average of 2.19 feet of fall per mile. Colonel Fife, in his Memorandum, deems that the fall may be less than this perhaps.

83. Reviewing Mr. De Gronsilliers' report in 1862, Major Haig remarked "that this report gives a very unfavourable account of the Wyngunga as regards navigation. In its natural state, this river appears to be useless for purposes of communication; and such a very

The side-channel.

The second or upper reach of the Wyngunga.

The obstruction at Peepree.

Slope of the bed of the Wyngunga.

Previous knowledge of the river.

* He supposes that 15,000 rupees (1,500 £.) in round numbers; but this must be too little.

very rocky bed affords little hope of the possibility of improvement without a considerable outlay." Now this remark about the nature of the bed is quite applicable to about 30 miles of one barrier and five miles of another, and to few detached obstructions at intervals. It is also true that the barrier impediments will not be removed without a considerable outlay. On the other hand, several sections of the river are now actually used for local trade and communication, some more, others less, and others but little. This traffic is at present of a detached and local character. But it is an existing fact of some importance. And the sections of the river used in some shape or another for communication, though at some points more imperfect than at others, do aggregate a mileage representing four-fifths of the entire course of the river below the Sautpoora Range. Of course, the circumstances of this existing communication are better known in 1866 than they could have been in 1862.

The channel of the Kunhan.

84. From its junction with the Wyngunga, the Kunhan is smoothly navigable at high water. Mr. Low recently passed down it. But at low water there are three small reefs off the villages of Kangaon, Panmara, and Chikna respectively, which, in their existing condition, would at that season be passable for small boats only. These were observed by Mr. De Gronsilliers. Further on, off the village of Rahree (or Reddie in the old maps), there is a barricade of rocks. Mr. De Gronsilliers, at low water, writes of them thus:—"A series of rocks exists which at Reddie completely bar all passage; and, considering the great quantity of rocks, and their unusual size, I should pronounce this part of the Kunhan impracticable for navigation, even in a high fresh." That this view is very correct is shown by Mr. Low's recent experience. He recently tried to pass the spot in a boat, even with the aid of the full flood, but failed. He writes thus of it:—

The obstruction at Rahree.

"This constitutes a regular fall in the river. We walked till we got to the foot of the bar. The length of the critical part is about 300 yards. When we got into the boat below, we could not see the water above the fall, of which the height must be seven feet. The water foamed and curled down it with crested waves." Here then there is a bar no doubt. But from the village of Jhurool (or Jooler), where the rocks begin, there is a small bend in the river, across which perhaps a short channel of some two or three miles might be cut: or the barrier itself might be turned into a weir. At all events this impediment might probably be overcome at a moderate outlay. From Jhurool on to Kamptee (15 miles) the navigation is clear. Mr. De Gronsilliers at low water considered the Kunhan in this section as "a fine river. The bed was pretty clear of rocks; we carried also good depths of water, and found generally 36 feet." Immediately above Kamptee, the bed of the Kunhan becomes again blockaded with rocks, of which Mr. Low gives an unfavourable account, having passed over them with difficulty in a boat during the season of high water. The length of the Kunhan from the confluence to Kamptee is 30 miles.

85. The Choonee river from its confluence with the Wyngunga up to the grain mart of Rampylee, a distance of ten miles, is navigable, and may even now be used by boats.

Obstructions in the bed of the Baug.

86. The channel of the Baug river is obstructed just before its junction with the Wyngunga, and just after it has received the waters of its affluent the Deo. This bar occurs between the villages of Rajagaon and Satona. Captain Newmarsh, the Deputy Commissioner, after examining the place in 1865, thus reports, "I found on inquiry from the boatmen that the bar is annually submerged when the river is in flood, but is not passable even for unladen boats till the floods subside sufficiently to allow of the points of the rocks being perceptible and thereby indicating the course of the channel between." * * * If this channel were to be cleared and formed in a curve, by keeping along close to the north bank, the rush of the water would be much diminished; but to make this passage safe for laden boats a good number of rocks would require to be removed. But all the boatmen present seemed to think this round-about channel the most practicable scheme." Captain Newmarsh proceeds to state, that this impediment might be overcome with a very moderate outlay.*

87. Just beyond this the Baug, as already stated, is joined by the Deo, rising in the southern crest of the Sautpoora Range, passing through a rich country; and navigable for some miles at high water. Further on, the Baug is joined by the Sohun or Sone, much the same sort of stream as the Deo, also flowing through a rich tract, and navigable for some miles at high water. Then the Baug passes near the town of Kampta, and skirts the tract known as the Lanjee Talooqua.

88. Writing on this subject in 1865, Mr. R. E. Egerton, the Commissioner of the Nagpore Division observes:—"The produce of the district through which the Wyngunga, and its affluent the Baug with the Deo and the Sohun, flow, is carried during the rains in boats of small burden to the landing-place of Oomurwarra near Toomsur. * * * The river traffic is very extensive; and water carriage becomes available at a time when land carriage is stopped. It is therefore very important that obstructions to water carriage should be removed as far as possible. * * * If this bar could be improved, so that laden boats could pass them during floods, the cost of carriage of produce would be much lessened, the amount of traffic increased, and the time of each voyage reduced." The navigable

* He supposes, in round numbers, that the cost would be 10,000 rupees (1,000 £), but this must be too little.

navigable length of the river Baug, with its feeders the Deo and Sohun, cannot be less than 30 miles.

89. The above general description of the channel of the Wyngunga, and its affluents, may be summed up thus:—

I. Immediately below the confluence of the Wyngunga and the Wurdah that is in the Pranheeta, there is a barrier about 23 miles long; irrespectively of some seven miles of barrier in the Wurdah immediately above the confluence. This is included in what is officially styled “the third barrier of the Godavery.” Conclusions regarding the channel of the Wyngunga and its affluents.

II. Just above its mouth or confluence, the Wyngunga has a barrier of 30 miles in length, the upper crest of which commences from a point a little below the town of Chamoorsee; and which may be styled “the first or greater barrier of the Wyngunga.”

III. From a little below Chamoorsee to the town of Pohonee and on to the foot of the Ambora hills, there is a reach now actually navigated, and having but occasional minor obstructions at about six places, over a length of 103 miles, which may be styled “the first or lower reach of the Wyngunga.”

IV. From Ambora to Mugurdokra, a few miles south of the town and station of Bhundarah, there is a barrier five miles in length, which may be styled “the second or lesser barrier of the Wyngunga.”

V. From Mugurdokra, up to near the foot of the Sautpoora Range, there is a reach 85 miles in length now actually navigated, save at one interruption, which is of a removable character. This may be styled “the second or upper reach of the Wyngunga.”

VI. The Kunhan, an affluent of the Wyngunga, is navigable from Kamptee to its mouth for 30 miles, save at one point of interruption, which could be surmounted without difficulty.

VII. The Chonee, an affluent of the Wyngunga, is navigable up to Rampylee, a distance of 10 miles.

VIII. The Baug, an affluent of the Wyngunga, including its two feeders, the Deo and the Sohun, is navigable for 30 miles, save at one point, where the obstructions are quite surmountable.

IX. If these several barriers and occasional obstructions could be overcome, there would be opened up 223 miles of through navigation in the Wyngunga itself, and 70 miles of its affluents; in all 293 miles; in the midst of a country for the most part rich and populated: and this in combination with the Godavery scheme, but in addition to any extent of navigation heretofore promised from that project.

X. Of the above 293 miles, some 163 miles are even now partially and locally navigated, though to an extent quite incommensurate with the resources of the country; but owing to the said barriers and obstructions, there is no through navigation whatever.

SECTION VIII.—THE PRACTICABLE MEANS OF OPENING THE NAVIGATION.

90. The primary object is to connect the navigation of the Wyngunga with that of the Godavery. It has been seen already, from para. 3 of this Minute, that Colonel Fife suggests that the weir to be built for the third barrier of the Godavery should be placed just below the junction of the Wyngunga; and that the canal already under consideration should be commenced from that point, and thence taken down to Mogellee, at the foot of the third barrier. This, he justly observes, would connect the navigation of the Wyngunga with the Godavery project. Moreover, he holds that such a weir would “answer for both rivers (*i.e.* both the Wyngunga and the Wurdah). He thinks it should be 28 feet high, or rather more; doubtless it should be at least 30 feet high. Inasmuch as the combination of the navigation of the Godavery with that of the Wyngunga, or the adaptation of the Godavery project to contingent works on the Wyngunga, depend on the main weir being below the confluence, the matter becomes one of fundamental importance, and should be taken into immediate consideration, whatever view may be formed of schemes for the Wyngunga itself. Further, Colonel Fife truly remarks, that a weir so placed would overcome some 20 feet out of the perpendicular measurement of falls and rapids in the lower barrier of the Wyngunga itself. He goes on to say, that without a survey it is impossible to specify how many more weirs would be required to overcome the remaining falls and rapids in this part of the river; but considering that the main channel is of moderate dimensions, and that stone material is very abundant, he believes that “the construction of the weir need not be a difficult or expensive matter.”

Weir below the confluence of the Wurdah and Wyngunga.

Its fundamental importance.

91. It has been seen that the first or greater barrier of the Wyngunga extends for at least 30 miles or more; and thus the size or number of weirs would largely depend on the slope of the bed within this distance. Colonel Fife seems to consider that the fall may amount to 60 feet, which would give two feet per mile. I should apprehend, however, that the total fall may be in excess of this, the slope in this section being probably more than two feet per mile. On the assumption, however, that there may be from 60 to 80 feet to be overcome, two weirs would seemingly suffice; perhaps they might be somewhere in the neighbourhood of the Koorta island, and the Larolee island, described in the foregoing section VII. of this Minute. Or if a short canal were preferred, then on either bank the ground is generally

Works requisite in the first or lower barrier of the Wyngunga.

flat; not intersected by any considerable stream, and having nothing more than the ordinary surface drainage. Thus it would appear quite possible that (exclusive of the main weir below the confluence which would subserve jointly the Wyngunga and the Wurdah) the first or greater barrier of the Wyngunga proper might be surmounted by an outlay not materially exceeding that contemplated for the minor project at the first barrier of the Godavery, or for the approved project of the second barrier.

Detached works in the lower reach of the river.

92. This done, the navigation would be cleared to a point somewhere near Chamoorsee, and the communication would be opened into the lower basin of the Wyngunga, the country described in section IV. of this Minute. From below Chamoorsee upwards to Ambora, we have seen that there is a reach of 103 miles, interrupted only by occasional obstructions which could be removed by detached works similar to those already approved for the several reaches of the Godavery. Perhaps these detached works would have, at one or two points, to be somewhat larger than the detached works on the Godavery, though they might be similar in kind.

Probable work at the second or upper barrier.

93. Then, at the second or lesser barrier, there are rocks, to manage which would require a work something of the same kind (though of lesser extent) as that proposed for the second barrier of the Godavery. But then it has been seen that there is a fair chance of the side channel which the river is scooping out for itself laterally, being regulated and made use of for navigation, to the avoidance of the crest of the barrier. In the latter case the outlay would be of a diminished character, and would not be large.

Removal of obstructions in the upper reach of the river.

94. The second barrier being got over, navigation is opened right into the country described in section III. of this Minute as the upper basin of the Wyngunga. This territory, one of the finest parts of these provinces, is permeated by the upper reach of the Wyngunga some 85 miles in length, and by its navigable affluents the Kunan, the Choonee, and the Baug, with a further length of 70 miles. In all these reaches and lengths there are but three obstructions; one in the Wyngunga itself, one in the Kunhan, and one in the Baug, all which can be overcome at a moderate cost, by detached works resembling those in the Godavery reaches.

Facilities for storage of water.

95. If it were desired to store water for the supply of the navigable channel of the Wyngunga, then (whatever be the difficulties in the case of other rivers) there are, in the case of this river, extraordinary facilities. It is not easy to imagine more suitable sites for such a purpose than those which have been actually found near the head of the Wyngunga and its tributaries. Colonel Fife remarks, "the facilities for storing water are very remarkable * * * Compared to one of the best tank sites we have been able to find in the Deccan part of the Bombay Presidency, the advantages are in proportion of nearly 7 to 1." He shows that in the Deccan only 114 cubic yards can be stored for the rupee, whereas for the Wyngunga as much as 900 cubic yards can be stored for the rupee.

The Pench reservoir.

96. It has been ascertained by Mr. Hanna, that for 16 lakhs of rupees, or 160,000 £., the waters of the Pench could be stored for the use of the Wyngunga, to the amount of 455 millions of cubic yards; it might not be necessary to store so great a quantity. If less were to be stored, the cost (if not quite proportionately reduced) would be less. Similarly as much of the Kunhan water as might be required could be stored for the Wyngunga. Further, there is a noble site where the whole waters of the Wyngunga during its course within the Sautpoora range could be collected and stored in a lake, by a dam across the gorge bed of the river at the point where it finally debouches from the hills. The dam, however, would be nearly three miles long, and the work, though apparently quite feasible, according to Mr. Hanna's examination, would be beyond any outlay which could be recommended in this Minute.

Effect of the Wyngunga Weir upon the Wurdah.

97. Lastly, in reference to the foregoing para. 90, regarding a weir to be constructed just below the confluence of the Wyngunga and Wurdah, which it is believed would answer for both rivers, it may be well to add just one observation regarding the Wurdah. It will be borne in mind, that the Wyngunga joins the Wurdah in the midst of what is now called the third barrier of the Godavery. That part of the barrier which is below the junction has been already described in this Minute. It has been seen, too, that above the junction to the upper crest of the barrier, there is a distance of seven miles, within which, Colonel Fife observes, that between these points there is a fall of 28 feet. A weir, therefore, of 30 feet below the confluence would not benefit the Wurdah quite so much as a weir at the upper crest. Still, it is clear, that a weir of 38 feet or so, just below the junction of the Wyngunga, would cause all the rocks of the upper crest to be submerged, and would dam the water up for a short way beyond. Then Colonel Fife remarks, that "the Wurdah's bed is so flat immediately above the barrier, that the effect of a weir placed even on the lower site (*i.e.* below the junction of the Wyngunga) will extend a long way up the Wurdah." If the Wurdah is to be made navigable above the third barrier, it must (as is well known) have weirs or some such works at intervals. Then Colonel Fife remarks, that "a suitable site for another weir where the Wurdah is comparatively narrow may be found."

98. From all this it seems manifest that the principal work at the third barrier of the Godavery, the opening of which has been long under consideration, and the prosecution of which is, according to the Secretary of State's Despatch of February 1866, definitely decided

cided on, can be so placed, and can be constructed on such a site as to form the basis of the Wyngunga navigation works, while subserving almost equally well the requirements of the Wurdah.

SECTION IX.—CONCLUSION.

99. The concluding part of this Minute may proceed from the starting of the Secretary of State's Despatch, No. 11, of the 8th February 1866, prescribing that the third barrier of the Godavery is to be opened. This barrier is to be so opened with a view of providing navigation in the rivers above that point. Now what are these rivers? They are two, the Wurdah and the Wyngunga. Firstly, as regards the Wurdah, without any depreciation of its importance, and with full recognition of its cardinal advantage in flowing through the best cotton field, still the objections to it are:—that it is not *per se* a very large stream; that its main affluent, the Pyngunga, flows from end to end through foreign territory; that it has not a great navigable length; that it has not a very large volume and discharge; that it does not drain, or water, as the case may be, a very great extent of British territory; that it has nothing which could be called a local boat traffic. Now, secondly, the Wyngunga possesses every one of those advantages in which the Wurdah is somewhat deficient: it has a long course, mostly navigable; it has a mighty volume; it traverses a broad territory, comprising the richest and strongest districts of the Central Provinces; it passes near to the two capital cities of the country; it already has a local boat traffic.

Secretary of State's Despatch regarding the third barrier.

100. If, then, the third barrier of the Godavery is to be opened for the sake of the rivers beyond, the Wyngunga claims attention even more than the Wurdah, and offers even a more promising field for the outlay of capital. The Secretary of State appears to consider that navigation should be conducted into the heart of the Nagpore country. The Wyngunga would accomplish this great object, even better than the Wurdah. For the Wyngunga (with its feeder, the Kunhan) would bring navigation almost to the very doors of Nagpore and Kamptee. One objection to the project for the Godavery with the Wurdah has always been, that the boat traffic, now non-existent, will have to be created. But for the project of the Godavery with the Wyngunga it can be said that there already is a boat traffic, which may well be the nucleus of a great trade. Another objection to the river above the third barrier has been, that the navigable length would not be great. But with the Wyngunga an additional length of nearly 300 miles would be afforded beyond the third barrier. Further, it has always been objected to the Godavery that it flows through a wild country. But a large part of the upper length of the Wyngunga flows through fertile and peopled territories, with a population of more than 2,000,000.

Importance of connecting that with the Wyngunga.

101. If effect is to be given to the declared intention of opening the third barrier of the Godavery, then it follows, as a corollary and as an integral part of the scheme, that the channel of the Wyngunga, right up to Nagpore, should be professionally examined. That it can be made navigable at a comparatively moderate outlay is probable. This *primâ facie* probability should be tested by full and competent examination. For, if the practicability of the works were demonstrated, it is sufficiently certain that the future results would be excellent.

102. On all the grounds set forth, or attempted to be set forth, in this Minute, I recommend that when the professional designs, plans, and estimates are made for the third barrier of the Godavery, the combination of that work with other works for the navigation of the Wyngunga be specifically considered, and that the inquiries be extended, not only up the Wurdah, but also up the Wyngunga.

Professional examination of the Wyngunga recommended.

103. If this general view shall be approved by the Government of India, I can submit, separately, a sketch of the engineering establishments required, which will, however, be moderate.

R. Temple.

Nagpore, 18 September, 1866.

APPENDIX.

EXTRACT from a LETTER of Mr. De Gronsilliers, Executive Engineer, referred to in Para. 51.

32. Mr. Farley joined me again in Kamptee on the 24th September, and we commenced descending the Kunhan river on the 26th September in four sangadies (canoes) which had been hired and housed over for the purposes.

33. Thence to a village called Jooler, a distance of 15 miles, the Kunhan is a fine river, the bed being not only pretty clear of rocks, but we carried also good depths of water, and found only off Pepree and Kangaon less than 36 feet of water. Kamptee to Jooler.

34. From half mile below Jooler to Mohoda, a distance of six miles, series of rocks exist, which at Reddie completely bar all passage, and considering the great quantity of rocks, and the unusual large size of the same, I should pronounce this part of the Kunhan impracticable for navigation even in a high fresh. Reddie barrier.

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35. From

- Bad rocks. 35. From Mohoda to the junction with the Wyngunga, a distance of about 16 miles, three other reefs exist, viz., of Chikna, Panmara, and Kangaon, at present impassable, except for very small boats.
- Shoal off Mohogaon. 36. Mohogaon is the only place where shoal water, $1\frac{1}{2}$ feet, is to be found, in all other places three feet is the least depth.
- Current. 37. The current in the Kunhan averages about two miles per hour.
- Junction with the Wyngunga. 38. The Kunhan joins the Wyngunga at Tiddee, about eight miles below Bhundarah.
- Departure from Bhundarah. 39. I inspected the Wyngunga from Bhundarah downwards, and left that place on the 3rd October.
- Mugurdokra rocks. 40. The first large masses of rocks we encountered were about seven miles below Bhundarah off Mugurdokra; they extend for about half a mile, and have at present no practicable passage between them.
- Ridges of rocks off Ambora. 41. Off Ambora, ridges of rocks run right across the river, and leave only narrow shoots for small boats to pass through.
- Rocks below Soonder and Kurraie. 42. Below Soonder and Kurraie the river is literally strewed all over with rocks.
- Ridge of rocks off Ghosee. 43. Off Ghosee, another ridge of rocks stretches from bank to bank with two narrow shoots through them.
- River from Ghosee to Peepulgaon. 44. From Ghosee to Peepulgaon, the river (40 miles) is pretty clear of rocks, at least those off Howree; above and below Lardu, above Chicholee, and above Kurkurra, are easily avoided and not in the channel. The river is in this distance in many places very broad, and also very shallow.
- Peepulgaon barrier. 45. Off Peepulgaon another barrier blockades the passage, and rocks are more or less dispersed over the river bed till we reach Oogara, a distance of five miles.
- Oogara and Soonee barriers. 46. Off Oogara another barrier exists; another off Soonee; and from Gurhchorolee Ghat till the junction with the Wurdah at Koongara, a distance of 65 miles, I may well call a continuation of the third barrier in the Pranheeda.
- Worst places in the barrier. 47. The worst places in this barrier are off Chiklee, with eight feet fall in two miles, between Dudgaon and Sonapoor; between Kurrelee and Arumba, with six feet fall in two miles; from Kowtee to Pardee with five feet fall; off Bhorghat with 13 feet 6 inches fall in $1\frac{1}{2}$ mile; off Larolee with 13 feet 6 inches fall in three miles; and above Larolee with 8 feet 10 inches fall.
- End of journey.* 49. We reached Koongara on the 16th October, and went on board the "May Flower" laying off Kirmeree, the following day.
- State of rivers this year by native report. 50. From what I can ascertain from the natives along the banks of both rivers, I find that the freshes this year have been high; further that the water has fallen off very rapidly, and is considerably lower than what it used to be in other years.

Enclosure 5, in No. 17.

(No. 50c, dated 15th December 1866.)

From *C. Bernard*, Esq., Secretary to Chief Commissioner, Central Provinces, to Secretary to Government of India, Public Works Department.

In continuation of my letter forwarding printed copies of the report on the Godavery works by Colonels Anderson and Fife, and of the Chief Commissioner's Minute thereon, I am now directed to submit the following further papers on the same subject, namely—

Major Haig's Memorandum on the Committee's Report.

The Chief Commissioner's Minute transmitting Major Haig's Memorandum.

MINUTE by *R. Temple*, Esq., C.S.I., Chief Commissioner of Central Provinces;
dated 18th December 1866.

SINCE writing my Minute of September last, on transmission to the Government of India of the Report by Colonels Anderson and Fife on the Godavery navigation, Major Haig has returned from England, and I have had the advantage of conferring with him on the whole subject. I then requested him to prepare a memorandum of his views after a perusal of these

these papers. This he has done, and I now desire to lay his Memorandum before the Government of India. He enters at some length into the points discussed in many parts of the report by Colonels Anderson and Fife. In some passages he criticises their opinions or conclusions in a tone which may, perhaps, be regarded as too controversial, and may on that score be objected to. But as some warmth of expression is apt to occur in discussions on difficult and important subjects, I have deemed it better to transmit the Memorandum as it stands, as the substance of it, at all events, is such as the Government of India may desire to have under consideration.

2. The main topic treated of in Major Haig's paras. 1 to 17 inclusive, is the importance of steam navigation on the river in opposition to the view of Colonels Anderson and Fife, who think that steamers might be dispensed with. The Government of India will have seen from my Minute of September last that, in the above respect, I entirely concur with Major Haig. Nothing need here be added to the arguments I then offered.

3. In that Minute I observed that we ought to be sure that the lock dimensions proposed by Major Haig are fully sufficient for the class of steamers required. I find on verbal consultation with him that he, having recently had further and special means of inquiring in England, is satisfied of the sufficiency of these dimensions, and certainly he ought to be by this time in a position to judge.

4. It will be remarked that Major Haig is still confident of the efficiency of stern-wheel vessels, and certainly his printed pamphlet on American rivers evinces much inquiry on his part into the matter.

5. When the information from Messrs. Napier, as promised in Major Haig's 6th para., is received, it shall be duly forwarded to the Government of India.

6. In his paras. 19 to 21 inclusive, Major Haig expresses dissent from certain criticisms of Colonels Anderson and Fife on the first barrier design. These points being chiefly professional, do not seem to require comment here.

7. In his paras. 21 and 22, Major Haig adverts to the question as to whether the major or the minor project for the first barrier should be prepared. In my Minute of September last, I expressed a decided preference for the major project, the prosecution of which I earnestly recommended. It will be seen that Major Haig fully concurs in this. Having recently conferred with him on the subject, I am more than ever convinced that the minor project, though it might be passably good, or barely sufficient, would never be quite good, would never perfectly answer either for the steamers in the rains, or for the boats in the dry season. On the other hand, the major project, though not free from engineering difficulties, does yet only involve such obstacles as can certainly be overcome, and, when carried out, it would, no doubt, answer well. I would, therefore, decidedly support Major Haig's recommendation for the prosecution of the major project, as being the one on which all the engineering authorities agree as the most efficient, and as being the one which, upon every general consideration, holds out the fairest prospect of success. After all the delays and disappointment which have occurred, it is apparently most important that the project decided on should be the very best that can reasonably be had, and the one most surely calculated to fulfil the objects in view.

8. Towards the close of Major Haig's para. 22, there are certain expressions which might at first sight be thought to mean that the anicut at first barrier was not necessary for a five months' navigation; such, however, is not Major Haig's meaning, as is evident from the statement in the same paragraph that, "even for a five months' navigation, the river could not have been depended on without an anicut." In that statement I believe Major Haig to be quite correct.

9. From his 23rd to 32nd paras. inclusive, Major Haig replies to the criticisms by Colonels Anderson and Fife on his project for the second barrier. The points being purely professional, comment seems hardly to be required here. I would only remark that, when the project was brought forward in 1864, the designs were thought good by this Administration, and that, if Major Haig is to be relied on to carry out the work, the Government of India may, perhaps, prefer to allow him to decide the engineering details.

10. To some extent, too, the Government seems to be committed to the general scope of the project, inasmuch as it appears from Major Haig's 33rd para. that he has already, during his recent sojourn in England, ordered plant, &c., suited to the design as previously proposed.

11. Major Haig's para. 34 respecting groins, does not require special comment.

12. Para. 35 relates to past expenditure, regarding which I have nothing to add beyond what was stated in my Minute of September last.

13. Major Haig's para. 38 to his concluding para. 43 relate to the separate memoranda by Colonels Anderson and Fife, respectively. Hereon I have only one remark to make, besides what was stated in my Minute of September last. In his para. 38, Major Haig remarks in reply to Colonel Fife's Memorandum respecting the storage of water for the supply of the navigable channel:—

"It is satisfactory to find that at last one man has been found to come forward and

recommend for investigation a scheme which has always been regarded as the wildest and most preposterous of even Godavery projects."

14. This passage might at first sight convey an impression not quite correct. For whatever may, or may not, have been the views held by some, such has not been the view held by this Administration. Doubtless such storage has always been regarded as difficult, and the scheme has been looked on as uncertain, until the specific localities for such operations should have been found. But this Administration has not only recommended investigation, but has actually investigated the scheme, and has submitted several sets of papers thereon to the Government of India. My Minute on the River Pench showed that sites for such storage can be found for the Godavery proper, but not for the Wurda. What has been thought, and is still thought almost impracticable, is to supply the River Wurda from storage reservoirs owing to the difficulty of finding sites for such reservoirs.

15. Although, as already observed, some of Major Haig's opinion may be expressed in too positive terms, yet, irrespectively of that, I would solicit for them the consideration which is merited by his great ability and experience, and his devoted zeal to the cause in hand.

MEMORANDUM by Major *F. T. Haig*, R.E. Superintending Engineer, Upper Godavery Circle, on Lieutenant Colonels *Anderson* and *Fife's* Report upon the Godavery Works.

I PROPOSE to notice, first, a few of the principal points in which the report of the committee agrees with my own views, and, second, those in which I am obliged to differ from it.

2. It is satisfactory to me to find that the project, as originally brought forward, for opening navigation to Chanda or Hingunghât, is, in its main features, approved of by the Committee. They are of opinion that, "before the communication can be pronounced efficient, the line of navigation should be continued as far as Chanda on the Wurda," and Colonel Fife would advocate a further examination of the river and its tributaries, in connection with storage works, with a view to increase the natural supply during the dry season." This is all that I have ever maintained or asked for.

3. The committee further consider that "excluding the portion of the estimate which relates to the construction of a road from Sironcha to Chanda, the expenditure contemplated is approximately sufficient for the scheme, as at present defined by the Government."

Whatever differences of opinion may exist, as to the probable cost of particular works, it will be satisfactory to the Government to learn that, in the opinion of the committee, the probable limits of the expenditure required for the completion of the scheme may now be defined with some certainty.

4. The committee also consider that "the general improvement of the country, and the increase of trade, which will be induced by the opening of the communication, will be sufficient to justify the outlay."

This conclusion derives increased importance from the fact that the committee contemplate a boat traffic only without the aid of steam. If, at a trifling additional cost, the river can be navigated with advantage by steamers also, the value of the communication will be proportionately increased.

The committee adduce figures to show the great importance of the boat traffic on the Ganges and Indus. On the former river the number of boats have increased, in the last 11 years, from 142,000 to 251,000. On the Indus the boat tonnage has risen, in the last three years only, from 60,000 to 70,000 tons.

5. I will now notice a few of the points upon which I differ from the committee.

6. With regard to the use of steam-power upon the river:—Upon this subject I am totally opposed to the views of the committee, and fully coincide with all that Mr. Temple has said in his Minute upon the committee's report.

The committee observe, "steam navigation, though it has been long established, does not, as far as we can learn, pay well enough to enable it to compete with the railway on the Ganges, and on the Indus pays apparently barely 5 per cent. How can it be expected then that steamers can be worked profitably, on the Godavery, when the navigation for steamers, with draught of three feet, will be open for only four or five months of the year, and when the only single advantage, to counterbalance this drawback, is the cheapness of fuel, and while there are serious disadvantages from the heavy floods and frequency of rocks?" To this I would reply,—

1st. I am not at all satisfied of the inability of the Ganges steamers to compete with the railway. I know that up to a year ago, at least one of the navigation companies was still paying 20 per cent. per annum to its shareholders.

2nd. The

2nd. The shortest distance by river between Calcutta and the Upper Provinces is, I believe, more than one-third greater than that by rail, and during eight months of the year, when the steamers are obliged to take the more circuitous route of the Soonderbunds, about twice as much. This is an immense disadvantage, which will not be met with on the Godavery, when the distance from Nagpoor, by the river, to Cocanada is about the same as that by rail to Bombay.

3rd. The "cheapness of fuel" on the Godavery is a most important advantage, the cost being, I believe, not above one-third of that on the Ganges. The whole of the coal, for the down-trip on the Ganges, has to be first sent all the way up-river from Burdwan, several hundred miles. Its first cost is much greater than that of the wood-fuel so abundant all along the Godavery, and it is further burdened with the cost of some hundreds of miles of up-stream carriage.

Those who have analysed the working expenses of steamers know that the cost of fuel is a principal item, and upon it depends, in a very important degree, the comparative cost of steam transport on different rivers.

This remark applies, I believe, with nearly equal force, to the Indus.

4th. The "disadvantages from heavy floods" are not nearly so serious as the committee appear to suppose. The flood season lasts for three months only, and the "heavy floods," when the current is at all obstructive to up-stream navigation, not above three weeks, and of those three weeks there is not above one during which even the feeble little steamers now on the river find the ascent of the stream impracticable. On the Indus the river is in flood for six months; it rises steadily, with a constantly increasing current, for the greater part of that time, instead of being subject, like the Godavery, to only two freshes, which rise and subside in the course of a few weeks, and having a broad flat bed, of immense width, and constantly shifting channel, the steamers cannot, like those of the Godavery, hug the sides of steep banks, where a current, not more than half that in the middle of the stream, is met with.

As far, therefore, as "frequency of floods" affects the quality of the navigation, by the increased rapidity of current, the Godavery has a decided advantage over the Indus. I cannot speak with the same confidence about the Ganges, but in its case also I apprehend, from the similarity of the shape of its bed to that of the Indus, that steamers ascending the river have, as a rule, to contend with nearly the full force of the current, instead of, as in the case of the Godavery, only that which is met with along the sides.

I suppose that "the frequency of rocks" has reference to the barriers only, as of course all isolated and scattered rocks in the open parts of the bed between the barriers will be removed. There will of course be some delay caused by the passage of steamers through the locks at the barriers, but this will, to a considerable extent, be compensated for by the increased speed which will be attainable by ascending steamers in the slack-water pools extending for many miles above each barrier.

5th. The above remarks have reference chiefly to the monsoon navigation; but supposing the river to be navigable, as I shall presently show, during the dry season, the advantages of diminished current and well-defined channel are all in favour of the Godavery. The committee themselves observe:—"Except during freshes, the current of the Godavery is very much slacker than that of either the Ganges or Indus, and its channel from the heavy coarse-sand and shingle of which the bed is composed is infinitely less variable."

This is surely a most important advantage, and one to which due weight should be given in comparing the navigable capabilities of the three rivers.

6th. The committee admit, paragraph 42, that a steamer, with a draught of 18 inches, could run up to the 15th February, or for eight months of the year, but state that "such a class of steamer would be incapable of working efficiently in the high freshes." There appears to be here some uncertainty as to the meaning of the term "high freshes." If it means such freshes as seriously obstruct the navigation of the river by a steamer having a speed of 10 miles an hour, then such freshes do not last for at most a week in the year, and do not occur every year.

If, on the other hand, it is meant that a steamer of the class referred to would be incapable of working efficiently throughout the three or four months of the monsoon, when the river is more or less in flood, then the committee are altogether in error as to the capabilities of such steamers. Only one of the steamers now on the river has a speed approaching 10 miles an hour, the rest vary from six to seven-and-a-half miles; yet all of these work steadily all through the monsoon. The current which they meet with at that time of the year along the banks is only about three or three-and-a-half miles an hour.

The banks are steep, and steamers have thus no difficulty in "hugging" them closely, and so avoiding the strong currents mid-river. But these steamers have all a draught of two to three or three-and-a-half feet. Three new steamers are now being built upon the Clyde, which, with a draught of only 12 inches, will have a speed, as usually worked, of 10 miles an hour, and by the use of a blower for increasing the production of steam in the boiler

boiler of 12 miles an hour, whenever such speed may be required. I am not able, at this moment, to quote the authority of Mr. James Napier, their designer, for this statement, but as soon as I join my office will submit a copy of his letter.

The committee are aware that, if such a speed can be obtained in a steamer of only 12 inches draught, much higher can be obtained with 18 inches draught.

Double the power, which would give one-fourth more speed, could, in fact, be put into the 18-inch steamer.

This fact is decisive as to the question whether a steamer capable of navigating the river in February would be equally efficient during the flood season.

Steamers, with a speed less than 10 miles, now navigate the river effectively during the monsoon; and if a steamer, with a draught of only 12 inches, can be built with a higher speed than 10 miles, one with a draught of 18 inches will have a yet higher speed, and be proportionately more efficient.

7. For the above reasons I cannot assent to the conclusion which the committee draw to the disparagement of the Godavery as a steam communication from a comparison of it with the Ganges and Indus.

Taking into consideration the fact that with light draught steamers the Godavery may be navigated for the greater part of the year (for if 18-inch draught is practicable up to February, 12-inch draught will certainly be so for a longer period), it appears to me that the comparative advantages and disadvantages of the three rivers are far too nearly balanced to warrant the conclusion that steam-navigation will be economically impracticable on the Godavery. On the contrary, I think, that the experience of the navigation of the river by eight or ten steamers for the past six years, the ascertained practicability of building steamers much more efficient in point of speed with a much less draught of water than any now upon the river, and a fair comparison of the Godavery with other rivers in regard to its physical characteristics, lead to an opposite conclusion, and justify the expectation that steam-power may be effectively and profitably employed upon this river.

8. The concluding paragraph 43 of that part of the Committee's Report which refers to this question, does indeed appear to me to imply doubt in their own minds as to the soundness of their conclusions. They observe: "In speaking of steam-power, we have considered it in relation to the conveyance of a heavy traffic. But our remarks do not apply to the use of small steamers for conveying passengers, and a very limited quantity of valuable cargo for a few years, till the value of the navigation has become understood and appreciated by the public, and when private enterprise may be expected to take the matter." If I rightly understand this, the committee consider that the river may, with advantage, be navigated by small steamers carrying a small quantity of goods, and look to the employment of private capital in such business. But the committee surely do not consider that navigation by small steamers like "those now on the river" would be more economical than by larger ones. The contrary is notoriously the case. Unless, then, I misapprehend the meaning of this paragraph, I must regard it as a concession of the point in dispute; and the more so, because it is evident that the committee contemplate navigation by means of steamers which will not pass through locks of the dimensions they recommend (150' x 20'), but which are to be stationed in the reaches between, a mode of navigation which it does not require much consideration to see, must be much more expensive than the ordinary one by means of steamers running up and down the river from end to end. If steam transport by this expensive method, and on a small scale is, in the opinion of the committee, likely to be both practicable and profitable enough to enlist private enterprise, much more would that be which might be obtained by the use of larger steamers than those now on the river navigating it without interruption from Chanda to the sea.

9. This leads me to remark upon the, in my opinion, extremely objectionable plan which the committee propose for navigating the river by means of steamers placed in the reaches between the barriers. The Chief Commissioner has pointed out the defects of such a system, supposing the river opened to Chanda as the committee propose, there would be four reaches between that town and Dowlaishwarum, in each of which two steamers must be placed to guard against an accident to one of them. The trains of barges must be run up and down the whole line with a punctuality which would certainly not be obtainable in practice to prevent loss from detention of steamers unemployed. An accident, a steamer grounding at any one point of the whole line, would involve the delay of the whole of the steamers for the time. These detentions are a source of considerable expense when only one steamer with her train of barges is employed. The loss would be four-fold in the case supposed. In fact, long and ruinous delays would be inevitable; and assuredly no private company would consent to work the river upon such a system.

The Chief Commissioner has further noticed the difficulty about the repairs of steamers so stationed between the barriers, and asks how, supposing them to have been sent down to the coast over the anicuts in freshes, as the committee suggest, they are to be taken back. It is certain that they could not return the same year, as there certainly would not be more than one fresh in the year in which the barriers would be passable; and, as this fresh seldom comes before September, a steamer would, in point of fact, lose the greater part of two navigation seasons. Such a defect would manifestly be fatal to the working of the river upon such a system.

To obviate it the committee suggest that the steamers might have their paddles taken off, and be passed through the locks. The locks are to be 150 feet $\times$ 20 feet—19 feet $\times$ 140 feet in length, would, therefore, be the largest dimensions of the hulls of the steamers so employed. If the committee are of opinion that the river can be effectively navigated by steamers of this size, I am at a loss to understand the reason for their doubts as to the sufficiency of locks 200 feet $\times$ 30 feet in the chamber, which would pass steamers of just double the tonnage.

Do the committee suppose that side-wheel steamers of 140 feet $\times$ 19 feet in the hull are safer and more effective than stern-wheelers of 180 feet $\times$ 29 feet?

10. I must next notice the objection of the committee to the use of steamers with stern-wheels. They "entertain misgivings of their success," and further observe—"They are applied on certain rivers in America, but there must surely be some points in which they are inferior to the side-paddle steamers, or why is it that the latter are so generally used in the larger class of rivers and the lakes?" The answer to this question only brings more strongly into view the peculiar advantages of the stern-wheelers. On the larger rivers and lakes there are not the same currents to contend with that are met with on the smaller affluents, which have always a greater slope, and as a stern-wheeler can, from the diminished "slips" of its wheel, ascend currents which a side-wheeler cannot stem, its peculiar adaptation to navigations of this description is at once apparent. Further, where canals and locks have to be passed, the stern-wheeler possesses marked advantages on the side-wheeler, which probably the committee admit it being less liable to injury from collision with the lock-walls or canal banks. This is a very important consideration in a line of navigation where, supposing the river open for steamers to Chanda, a steamer would have to traverse 108 miles of canal, and to pass through 56 locks in a single trip from the coast to Chanda and back.

The committee "believe that the side-paddles which must act as outriggers are a source of security to flat-bottomed vessels in a strong current, or in a whirlpool, such as is occasionally encountered on the Godavery during the freshes." I do not in the least see how they are to afford any such security. An out-rigger is a thing that floats alongside a boat, and by its weight in some cases, or by its buoyancy in others, prevents the boat being overturned. But paddle-wheels do not float in the water, and, however deeply immersed, can afford no buoyancy.

As to the "whirlpools," these have been from the outset the bugbear of the Godavery navigation. They sound very formidable, but are in truth perfectly insignificant. A whirlpool is met with at two points only in a distance of 450 miles, and at these two points it exists only in extreme floods, such as do not occur every year, and when they do occur, maintain the height at which whirlpools are formed, for perhaps four days. In fact, the existence of one of these whirls is a very doubtful matter.

I have myself run through the worst of them in a steamer with a speed of only seven miles an hour, and with her deck only 18 inches above water. They would not be of the slightest consequence to any properly built steamer, and even if they were, the detention they would cause would be trifling.

11. The committee think the stern-wheel "would be liable to injury, should the steamer be accidentally swept round against a rocky bank." The committee have evidently never seen or navigated the river in the flood season, or they would have known that this objection applies with ten-fold force to the side-wheelers. The latter are constantly liable to injury from striking against the banks when the steamer is running up-stream close along shore. We have frequently had our side-wheel steamers so injured, and in one instance very nearly lost one from this cause. The stern-wheel on the contrary is removed altogether from the reach of such injury, and with it a steamer may "hug" the bank much more closely without risk of accident.

12. The fact is, that the side-wheeler has no advantage whatever as regards facilities for quick manœuvring over a stern-wheeler, unless its wheels are, as is the case with many of the American steamers, disconnected, and worked by separate engines.

This arrangement, which however has not been found necessary anywhere in India, or indeed out of America, does give increased facilities in steering; but these can also be had, if required, in the stern-wheeler, by dividing the wheel into two, worked by separate engines, as is sometimes done on the Ohio. I do not, however, after several years' experience of the navigation of the Godavery in all states, anticipate any necessity for even this modification of the ordinary arrangement.

13. The committee further observe—"Mechanical engineers in England can have little knowledge of nature of the currents in a river like the Godavery, and any vessel on a new plan which they may build specially for its navigation must be regarded as an experiment." It is quite true that engineers in England can have little knowledge of the nature of the currents of the Godavery, but when they are instructed by officers who have a thorough practical acquaintance with the river, derived from years of observation, the case is very different, and under such conditions the probability is that the English engineer will turn out the class of vessel best adapted to the work.

I certainly should prefer a steamer designed in this manner to one such as the committee appear to suggest, built upon the model of the vessels in use on the Indus, a navigation of a very different character. The steamers now being built for the Indus were designed by

engineers in England who never saw the river, but who learnt from Captain Wood, an officer thoroughly acquainted with the river, what were the conditions which the steamers are required to fulfil. Surely a similar course should be pursued in the case of the Godavery.

14. I must here distinctly protest against the assumption which underlies all this part of the committee's report, that in determining the size of the locks, we have been proceeding on mere hypothesis, without any experience of the actual character and requirements of the Godavery navigation. All the information I have obtained by months of careful examination and inspections of dozens out of the hundreds of stern-wheel steamers on the western rivers of America is treated as mere hearsay: "Major Haig had heard such steamers well spoken of." The committee accordingly at once dismiss all that I have said upon the subject, and proceed to recommend a totally different class of steamers without any investigation whatever, merely because they "entertain misgivings" about the efficiency of stern-wheelers.

With all respect to the committee, I venture to ask of what importance are the "misgivings" of two officers who have never even seen, much less been on board of, a stern-wheel steamer?

How can they possibly judge as to their fitness or unfitness for a river, which neither of them has ever seen or sailed on in flood?

Who is most likely to form a correct opinion upon the subject, if not the officer who has seen and repeatedly navigated the American rivers in such steamers, and who has an intimate practical acquaintance with the Godavery navigation in all conditions of its stream?

To what purpose will be the expense which the Government have incurred in sending me to America, if the practical recommendations which I make, based upon all that I have seen, read, and heard in that country, are to be set aside in consequence of the "misgivings" of officers to whom the whole question of river navigation is entirely new, and whose references to "currents" and "whirlpool" show that their notions of the flood navigation of the Godavery are of a very vague and not very correct description, derived, as they undoubtedly were, from hearsay.

It is next assumed, paragraph 25, that the new vessels now being built are "on experiment," and "as so many similar" experiments "have ended in no useful result," the committee propose to go to the Indus for the model of a steamer for the Godavery?

When the Indus Flotilla Company ordered their last new steamers a year ago, why did they send their superintendent, Captain Wood, home to plan the vessels in conjunction with Messrs. Napier and Laird? Why did they not go to the Ganges for a model, or to the Godavery?

Would this have been a "safe" or "practical" way of setting about the matter?

Are the vessels which Captain Wood has ordered to be regarded as merely experimental? If not, why are those I have ordered for the Godavery to be viewed in that light? I know quite as much of the Godavery as Captain Wood does of the Indus. I have navigated it for years at all seasons. I know every mile of it. Am I not then competent to state what speed a steamer must have to navigate it with effect, and what draught of water?

The committee do not think so, so they go to the Indus, one of the "rivers of Upper India," not at all similar to the Godavery, for a type of a steamer; and what is the latest type of steamer sent out for the Punjab rivers? A stern-wheeler, the "Beas," built at Liverpool about two years ago. So when we get into Upper India, we find opinion there apparently undecided, or possibly inclining to the type of a steamer which the committee are afraid of!

So, again, in para. 29, the committee set aside all calculations as to the probable cost of steam-power on the Godavery, because "the traffic has to be created," and the "cost of working a flotilla must be matter of uncertainty." "Such hypothetical calculations are entirely unreliable." Here it is assumed that we know nothing about the cost of working a flotilla on the Godavery. Of what use then is our "Accounts" Department when steamers have been running on the Godavery since 1853? Are we still in ignorance of the cost of working them? Can we not tell the expense of the crew, of fuel, &c. &c.? The committee must be well aware that we have full information upon all these points.

They have never investigated the question; they, in plain words, know nothing whatever about it. How can they, if they have never examined it? No wonder, then, that they have doubts and misgivings. But is it right, on that account, to represent the whole matter as in a state of uncertainty, reliable calculations impossible, and all that has hitherto been written on the subject as based upon mere "hypothetical calculations"? I distinctly maintain, in opposition to the committee, that there is no such uncertainty. We do know the cost of working a flotilla on the Godavery (I except, of course, the cost of working on the committee's plan by means of steamers stationed between the barriers, as the "factor of safety" to be applied in this case, to cover the cost of delays, &c., all along the line, is at present decidedly hypothetical); and we do know the sort of steamer best suited to the navigation.

15. There are other points in the committee's observations upon this part of their subject which invite remark, but I will only notice one other. They observe that the primary object for which the Godavery works were commenced, was the conveyance of the cotton of Nag-poor to the sea; that this object "is now accomplished by the Great Indian Peninsular Railway, and that as dealers are willing to pay a higher freight for cotton by rail from Allahabad to Calcutta, rather than send it by river, it is vain to expect that the Godavery will

will ever carry off any of the Nagpoor and Berar cotton"; and hence that the Government may well pause before they sanction any considerable expenditure on steamer locks." I have already pointed out the fallacy of this comparison of the Godavery with the Ganges, the distance to the sea by the one river being just the same as by rail; and by the other, at least half as much again.

The committee propose to locate the terminus of the navigation "at a considerable distance from the cotton field," viz., at Chanda, which, they rightly observe, would give a great advantage to the railway which runs right through the cotton country.

Considering, however, that there is no reason why the navigation should not be carried up at least to Hingunghât, and be connected by rail or canal with the cotton country to the west of the Wurda, I cannot believe that the Government or the manufacturing community in England, so deeply interested in this question, will consent deliberately to abandon the most important cotton tracts in India to a railway monopoly. It is of the utmost consequence that the navigation should be placed in a position to maintain a constant check upon the railway rates, and for this reason alone it should, in my opinion, be carried right up into the cotton country. It may not be thought advisable to do this in the first instance, but it must certainly be kept in view in planning the works on the part of the river below; whereas to substitute boat-locks only for steamer locks, would be at once to renounce it.

It is important, too, to remark that, even to the east of the Wurda, there is a considerable extent of cotton cultivation, of which Hingunghât is the centre, and which reaches down to Chanda. On the west good cotton is grown as far down as the head of the third barrier. There is thus a considerable tract of country properly dependent upon the river for the means of export.

16. But even if cotton took another route to the sea, is this the only staple likely to afford employment to steamers? Is cotton the only article of carriage on the Indus and Ganges?

Mr. Temple in his Minute upon the subject has pointed out what the uses of steamers upon the river would probably be, and it cannot be doubted that they would find abundant employment in traffic of a similar character to that on the Ganges and Indus.

17. The committee make no reference to the use of the Godavery for passenger traffic, and as a military line of communication for the transport of troops and stores. The Chief Commissioner has called attention to its importance for these purposes, which would seem to have altogether escaped the notice of the committee.

They cannot surely mean to sacrifice these important advantages by making the Godavery a mere boat navigation.

18. The Chief Commissioner has also pointed out how trifling a per-centage of saving upon the whole cost of the line would be effected by the reduction of the size of the locks proposed by the committee. There is an error in his calculation caused by the term used by the committee for the tail-locks at Gungole, first barrier. They speak in para. 90 of the "tail-lock," but it is in reality a double, if not a three-fold lock, and the actual saving upon a single lock would not be above 13,000 rupees, instead of 70,500 rupees, as assumed by Mr. Temple; but the result at which he arrives is nevertheless correct.

The saving, supposing the third barrier canal and locks to be made for boats and very small steamers only, as suggested in 1863, would be but 11,000 £, even if the first barrier project is carried out on the original design, and 27,000 £ if the locks at that barrier are made 200 feet $\times$ 30 feet as proposed for the other barriers, less than four per cent. on an outlay of a million sterling.

19. *First Barrier Works.*—With regard to the works at the first barrier, looking only at the minor project, as it is called, the committee appear, on the whole, to approve of the designs and general plan of the works. It is, perhaps, singular that the only part of the plan which they disapprove, the arrangement by which the river channel formed by the island on which the anicut abuts, is made to form the head of the canal, is that which above all others I hold possess the highest merit. I claim no credit for simply having availed myself of a natural feature of the ground which presents such very unusual advantages; but it is inexplicable to me that, with the knowledge which the committee must have of the difficulty of dealing with the silt which is carried in such enormous quantities into the canals with which they have both been connected, they should have failed to appreciate the immense advantage of an arrangement by which the silt is entirely deposited outside of the canal, and by the means of a scouring sluice swept out again into the river. No paragraph of the Report surprises me more than that in which they remark upon this part of the works, and there is none from which I more entirely dissent.

The flank of the anicut may be made perfectly secure from the encroachment of the river, and, had the committee been better informed, they would have known that the breach to which they refer in the head of the island was caused by the neglect of the executive engineer properly to close up an artificial cut through the island made for the purpose of carrying stone and lime to the anicut.

I entirely dissent from all that the committee say upon this part of their subject.

20. With regard to the committee's remarks upon the rates and cost of work at first barrier, I find it impossible now in any way to check their calculations, as no rates have been deduced in the Central Office of Account, and it is impossible to say whether what the committee give as information derived from the executive officers may be correct or not. This part of the report I must leave for future notice, when I shall have joined my head-quarters, and had an opportunity of investigating the accounts.

I will here remark upon only a few points:—

(a) The committee state that the cost of work on the Godavery is nearly $3\frac{1}{2}$ times that on the coast. They appear to me to have added $33\frac{1}{2}$ per cent. for miscellaneous charges twice over, those charges being included in the estimate rate of 22 rupees, and therefore I should suppose in the actual cost 28 rupees, which the committee state to have been the case. If their estimate of 30 rupees per 100 cubic feet includes such charges, then they seem certainly to have over-stated the comparative cost of the Godavery works, for this, divided by $3\frac{1}{2}$, would give only 8.6 rupees per 100 cubic feet for the cost of rubble masonry on a large scale in the beds of rivers in the Deltas, about one-half, I think, what it must cost now. Even if $33\frac{1}{2}$ per cent. is added, this would make the corresponding cost in the Delta 11.5 rupees, which, inclusive of all miscellaneous and contingent expenses, is, I believe, too low.

I doubt, therefore, whether the comparison is so unfavourable for the Godavery as it would appear.

(b) I do not see that the cost of establishments has been “most disproportionate” to the expenditure. Taking the committee’s own figures, I find that the charges for establishments amounted to 2,21,554 rupees out of a total expenditure of 12,73,644 rupees, or to 17.4 per cent. This rate appears to me to be extremely moderate, considering the peculiarly difficult circumstances under which the works have been prosecuted, and the necessity, owing to the unhealthiness of the climate, for extra men to supply the places of those frequently incapacitated by sickness.

(c) I quite dissent from the opinion of the committee as to the saving to be effected by the substitution of cattle for steam power. It is true that cattle are abundant, but the bullocks of the Godavery are very small, and, as a rule, unfitted for the severe labour of mortar-mills, &c. We have frequently had them completely disabled by this kind of work, and sometimes even killed by it; and taking into account the difficulty of supplying them with food, we are very glad to substitute, as soon as we could, steam-mortar mills, and I should be very sorry to resort now to what I believe to be the more expensive means of animal power.

(d) Of the past management of the works which the committee consider to have been neither successful nor economical, it would be vain for me here to attempt an elaborate vindication. It would involve the review of the past history of the works to an extent which would altogether overload this already lengthened paper, and it would revive old complaints which I am willing should be forgotten, of inadequate support, inadequate and constantly fluctuating supplies of funds, changes of plans on the part of the controlling authorities, and, for the first year or two at least of the operations, inefficient establishments. Not, indeed, that I suppose that I could even so altogether exonerate myself from a certain amount of blame. He who supposes that he could either plan or execute amid such unparalleled difficulties works on the scale of those on the Godavery without committing some mistakes, gives at once sufficient proof of his ignorance and incapacity. I do not suppose that it is possible for anyone who has not himself passed through the ordeal rightly to appreciate the difficulties of such an undertaking, and any arguments I might bring forward in my own defence would for this reason lose much of their force.

It is sufficient for me that the work done is, in the opinion of the committee, well done, and I think the reasons which they adduce for the high cost of the work are sufficient to account for it, without raising the question of defective management.

21. With regard to the alternative projects at the first barrier, viz., the short canal with locks at Gungole, and the long canal with locks at Gollagoodiem, I could have wished to have entered into a careful calculation of their comparative cost. But the materials for such a comparison are not to be had here, there being no copies of the estimates or plans in the Central Office, and the abstracts of the estimates available being insufficient for the purpose. I will therefore only observe that the question, which of the two projects is to be prepared, is one of cost only. The larger project is undoubtedly, as the committee observe, the most complete and certain of the two. The lesser, to whatever extent completed, will be more or less imperfect and objectionable, chiefly for the boat traffic. It would never have been brought forward had it not been, first, for the want of funds to prosecute the works on the upper part of the river at the same time with those at the first barrier, and the consequent prospect of a lengthened delay in opening the river; and, second, for the loss of workmen caused by the outbreak of cholera last year, and increased difficulties of carrying on the works consequent thereon, which, judging from a distance (for I was in England when I suggested that the minor project should be rendered more complete by the substitution of steamer for boat-locks), I supposed would tend greatly to enhance that delay. The lesser project involves undoubtedly the navigation of channels cleared through and lined by rocks, and in the up navigation the ascent of a current difficult for boats to overcome. Boats unaided by steam power could not venture down this channel at certain times of the flood-season, and certainly could not ascend it. If, therefore, funds are now available which will allow of the prosecution of the works at the second barrier simultaneously with those at the first, and of the surveys and preparatory operations for those at the third barrier, I have no hesitation in recommending that the long canal with the locks at Gollagoodiem should be completed. A considerable part of it has, indeed, been finished since the minor project was brought forward in 1863, and I should anticipate no difficulty after

after joining my head-quarters, and obtaining the accounts of past expenditure which are not available here, in estimating pretty accurately what amount may now be required to complete it. Lieutenant Roberts writes that he has 3,000 first-rate excavators on the spots, and under his management I should expect much better progress than has hitherto been made.

22. With regard to the question whether the anicut would have been necessary or not for a five months' navigation, which the committee answer in the negative, I subjoin an abstract from a recent letter from Lieutenant Roberts, in charge first barrier works:—

“The water-level on the 1st October 1865, in the sluice-channel, was $161\frac{1}{2}$, or $3\frac{1}{2}$ feet only above the sill of the head-lock.”

We reckon that the navigation commences from 20th June.

In 1865, therefore, in the middle of the fourth month only, there were but $3\frac{1}{2}$ feet water on the sill of the head-lock, and this, although the anicut has of course already partially raised the level of the water above it; the committee make no reference to this fact, and give no reason whatever for their opinion. The truth is that, even for a five months' navigation, the river could not have been depended upon without an anicut. But when the works were commenced, the idea of limiting the navigation to five months only was never entertained, and from the time that the Government of India ordered that only such works should be carried on as were necessary to a navigation of that period, no work was done to the anicut, unless it were to give employment to masons and labourers who otherwise would have had to be dismissed, or retained on batta at a heavy expense.

My orders to the executive officers were, that the completion of the anicut should be left to the last, as the least necessary of the works.

23. *Second Barrier Works.*—With regard to the second barrier, the committee object to the description of anicut proposed by me on the grounds of cost and of efficiency. First as to cost. I observe that the committee, para. 101, have resorted to the same return as I did (in Volume IV., Professional Papers, Madras Engineers) for the rates of work done in a similar anicut on the Kistna. They have, however, fallen into the error which that statement, apart from any explanation by the officer, Colonel Orr, who prepared it, would naturally cause.

The quantities in that statement are not, as I was myself informed by Colonel Orr, correct, but only about two-thirds of the true quantities. The statement was prepared in conformity with the instructions of the Revenue Board (the controlling authority in those days) in terms of the estimate, and the quantities shown are those in the estimate, and not the true ones, which are 33 per cent. higher. The cost of stone was therefore not 14·28 annas per cubic yard, but 9·52 annas.

24. The committee next state that the work at the Kistna could not now be done under Rs. 1. 8. per cubic yard.

As the charge for plant ($3\cdot38$ annas according to them) of course remains the same (plant being no dearer now than it was then), this makes the charge for labour, &c., $24-3\cdot38=20\cdot62$. This is what they consider this charge would amount to at present prices, instead of 10·9 annas, when the Kistna anicut was actually built. In other words, the rate is doubled. Now it must be remembered that we are speaking of the cost of the rough undressed stone, and that, therefore, any rise in the wages of bricklayers or masons does not affect the question. I am right in stating that the wages of the coolies and quarrymen employed on the Kistna anicut were from $4\frac{1}{2}$ to $5\frac{1}{2}$ rupees per month.

Do the committee mean that such labour cannot now be procured on the Kistna for less than 9 to 11 rupees?

We have proof positive that this cannot be the case in the fact that our workmen of the same class at first barrier only receive 7 to 8 rupees, and they are much more highly paid than similar workmen on the coast.

How is this to be reconciled with the committee's assertion that work (of this class, rough stone quarrying) costs three times as much on the Godavery as it does now on the coast? If we multiply the committee's supposed rates for labour on the coast, 9 to 11 rupees by 3 rupees, we get 27 to 33 rupees as the probable wages per month of coolies and quarrymen at the second barrier! Or, if a deduction of one-fourth be made, on the ground that wages represent only two-thirds of the actual cost of labour on the Godavery, we have still 20 to 25 rupees as the probable rates of wages at second barrier according to the committee. I see no room for error in these deductions from the committee's statement upon the subject; for it must be remembered that, as regards rough stonework, the only item of cost liable to increase is that of wages, as the cost of tools, machinery, powder-plant, remains just the same now as 15 years ago.

25. Now how immensely these calculations of the committee are in excess of the truth will appear from the fact that, while the tramroad was being built at the second barrier, Mr. MacGregor, who was in charge, had never any difficulty in keeping up a body of 1,200 men on wages of 5 rupees per month. They provided their own food, and they built their own huts, and really cost the Government nothing more than their wages. Mr. MacGregor had frequently to send away numbers who applied for work, and could easily have raised his numbers to 2,000 if required.

What are we then to make of a calculation based upon the assumption that the wages of such men, when the second barrier works are commenced, will be 20 to 25 rupees?

It is quite evident that the committee have generalised much too hastily, from the fact (as they suppose, but which I strongly doubt) that work generally at first barrier, including earthwork, quarrying, rubble masonry, and cut stone, costs three and a half times as much as similar works in the Deltas.

26. The truth is, that the circumstances under which the works at the second barrier will be carried on will be much more favourable than at the first barrier. At the second barrier we obtain access to a large extent of country where large and populous villages, only two to four days' march from the works, will supply all the labour we shall require for the rough stonework; and though we may pay higher, perhaps 50 per cent. for quarrymen, than we did in 1862 for common coolies, I have no reason to believe that the same rate, 5 rupees a head, or at most 6 rupees, will fail now to attract the same numbers that it did then; and those numbers will be quite sufficient, probably much more than sufficient, for the anicut works.

But in my estimate, *Rs.* 6. 8. per 100 cubic feet, I have doubled the Kistna rates, which would allow for wages of 9 to 11 rupees, and have added to these the cost of railroads, machinery, and hutting workmen.

I adhere to that estimate, and submit that that of the committee is enormously in excess of what a due consideration of the circumstances of the case will warrant.

27. Now as to the comparative cost of the two kinds of anicut, the committee propose to substitute for my rough stone anicut two masonry walls, one built about 100 feet below the other, and to half its height and thickness; assuming a height of 22 feet for the purpose of comparison, and allowing for a mean thickness of 14 feet, they calculate the cost of a running foot of wall at 100 rupees per foot. Nothing, however, is said about the second wall, which the committee "think necessary," and which would have a section one-fourth that of the main wall; no addition is made for coping, always an expensive item; no allowance for excavating foundations in the rock, nor for dams, baling, &c. The committee only omitted these, because even allowing liberally for them, the cost of their anicuts, according to their own showing, would still be much below mine. But for the purposes of strict comparison, these items must be included thus:—

	<i>Rs.</i>
Cost of main wall on the committee's data, allowing for 2 feet foundation in rock - - - - -	100
Coping 20 cubic feet at 75 rupees per 1,000 - - - - -	15
Excavating foundation $18 \times 2 = 36$ cubic feet, at 7 rupees per 1,000 - - - - -	2-5
TOTAL of Main Wall - - -	117-5
<i>Lower Wall.</i>	
	<i>Rs.</i>
One-fourth section of main wall - - - - -	25
Coping - - - - -	10
Foundations - - - - -	1
TOTAL of Lower Wall - - -	36
TOTAL of both Walls - - -	153-5
To this the committee would, it appears from para. 105, add 33½rd per cent. for contingent charges on labour - - -	51-2
Making a Total of - - -	204-7

without any allowance for dams.

The committee state the cost per running foot of an anicut on my plan, 22 feet high, to be 170 rupees, but calculating without plans or estimates, which, as I have already said, are not here available, and from memory, I think the cost must be 221 rupees per foot.

28. It would thus appear that, in point of cost, the committee's anicut would have no important advantage over mine.

It may be said that the above calculation is unfair, because, while it retains my original rates for rough stone work in calculating the cost of my anicut, it assumes the committee's increased rates in calculating theirs. But I am unable to dispute the committee's rates for masonry. I have no access to accounts, and must for the present assume them to be correct. My own rates for rough stonework I do maintain for the reasons above-mentioned.

29. On the other hand, I would observe that my section, from which the estimates were made for the anicut, was certainly a maximum section, and might be considerably reduced if we use large-sized blocks of stone. If I remember right, in the orders of the Govern-
ment

ment of India, upon the second barrier estimates, it was remarked that the section might be reduced with advantage. In calculating the cost per running foot, I have assumed a top width of 50 feet, with a down-stream slope of 8 to 1. The width on top might very probably be reduced to 30 feet, and with large stone the slope might perhaps be made 4 to 1, and less than that in the lower parts of the anicut.

30. But further, the committee appear to have entirely overlooked the great advantages which an anicut of the description I propose gives for economising labour. These are so great that they render any deductions as to the probable cost of rough stonework at second barrier from the known cost of rubble masonry at first barrier, quite inapplicable. Instead of having to collect a large body of labourers and masons to work in the river-bed under great disadvantages for only five or six months of the year, a small body of workmen, who may be thoroughly organised, work in the quarry all the year, and the stone may be deposited in the bed, without interruption, during eight or nine months. Instead of the manual labour required at every step in rubble masonry, in quarrying, breaking-up, handling the stone, in quarrying, burning the lime, in excavating foundations, making dams, baling, &c., almost the whole of the work is done by powder, and steam or animal power.

Much less superintendence is required, a smaller establishment will suffice, and consequently less accommodation has to be provided. The latter are items of saving which cannot be computed in such a calculation as that made above of the cost per running foot, but which are considerable in amount, and should be duly allowed for. In the case of works carried on under the disadvantages, in regard to climate, peculiar to the Godavery, these are very important considerations, and they have great weight in favour of a simple anicut of rough stone, instead of a masonry wall requiring such a much larger amount of labour of all descriptions, especially of skilled labour, which is the most expensive and difficult to obtain.

31. I will next notice the objections, of an engineering character, which the committee urge against a rough stone anicut.

1st. *Excessive Leakage.*—The committee say, paragraph 106, "We are of opinion that there are serious objections against the construction of a rough stone-weir, intended to withstand the pressure of 40 feet head of water." This way of putting the case conveys a very wrong impression. No one would imagine from it that there are only 170 feet in length, out of 4,050 feet, which will have to withstand such a head of water, and that of the remaining part of the anicut none will have more than 22 feet head, and much of it very much less. Such however is the case. So that, whatever difficulty there may be supposed to be about a head of 40 feet, it should be distinctly understood that it will be met with only along the one-twenty-fourth part of the whole length of the work. The committee "are quite satisfied that the leakage would be so great that it might be quite impossible to pond up the water to the requisite height when the supply in the river would be small." I am as perfectly certain that it would not. Can the committee adduce a single instance in support of their opinion? I have seen instances in which great leakage, through a bank of loose stone, has been completely stopped by simply choking up the interstices with small stones and gravel, and afterwards covering the slope with pure sand. But in the anicut I propose not only would this method be adopted, but the interstices between the stones on the up-stream slope would be filled up with concrete rammed in as deeply as a rammer could penetrate, and the committee are aware that our Godavery concrete does not soften under water pressure. I am satisfied that this objection is of no consequence whatever.

2nd. *The Severity of the Action of the Falling Water upon the Stonework.*—The committee, after showing that the afflux in floods will be about the same in the case of the second barrier anicut as in that of the Kistna, observe, "in the Bezwarra (Kistna) anicut, we should have, between high and low stages of the river, a difference of level in the upper and lower reaches, ranging between one and 18 feet, and in the second barrier anicut a difference ranging between one and a-half and 37 feet. Now this statement, though literally true, conveys an altogether erroneous impression. In the Kistna anicut, the difference of level between the water above and that immediately at foot of the work, is 18 feet in summer. At the second barrier the difference of level between the same points would be but 22 feet in the highest part of the work, and much less elsewhere, because the bed of rock in which the anicut will rest is itself, on an average, 18 feet above the summer level of the water, and maintains this level for a distance of fully a mile down stream. I leave out the part (170 feet) in length across the deep channel, because that may be easily protected against overfall in the way the committee propose for their anicut and which I had previously proposed for a similar work. The correct statement of the case would therefore be that while on the Kistna the head of water is 18 feet along the whole length of the work, at the second barrier it will not exceed 22 feet anywhere, and will be less than that along nearly half the whole length. The action of the overfall along half the anicut will undoubtedly be more severe than at the Kistna, but this will be far more than met by the much greater strength of the second barrier work than that at the Kistna. I have carefully inspected the latter work, and observed how rapidly the stone, which is more or less friable, wears away under the action of the water, many of the stones being not above half the size they were when put in, and certainly not averaging above one and-a-half

to two tons weight. They are not grouted, and only roughly packed together, yet that anicut is practically indestructible. The most the water ever does is to dig a hole at one spot, where Colonel Anderson is aware a strong current sets on to the work, being deflected from a hill above, and the stones have simply to be thrown in again every year; such repairs not costing, I believe, above 1 per cent. of the original cost. At the second barrier we propose to use larger, and far harder, and more durable stone, not necessarily of 10 tons weight, but probably averaging five tons, and to have the surface carefully levelled with a concrete which the committee state to be "of most excellent quality." There need not be the slightest difficulty about making the work perfectly secure, especially when we consider that it will rest on rock, and not on sand, as at the Kistna, which will admit of no settlement or loosening of the surface stones.

3rd. The committee have entirely misapprehended what I have written, as to the use of stones exceeding five tons in weight, and I am quite at a loss to understand how they can have done so. I have only touched upon the subject in one paragraph of one letter which they must have read, and I there stated most explicitly that I did not consider the use of stones larger than five tons at all necessary to the security of the work, and that I only proposed to use blocks up to 10 tons, if they should be found to be more economical.

The committee, however, argue against my anicut as if the use of 10 ton blocks were necessary to its security, and an essential part of the work. This is directly the reverse of what I stated.

It is surely quite possible that it may be found cheaper to move and deposit a block of 10 tons, rather than to break it up into two or three pieces, which have each to be lifted, moved, and deposited separately. The number of such blocks in the whole work would be very small; and accordingly, in the machinery I have sent out from England, only a small part of it is designed for lifting and moving stone of this size.

32. For the reasons above stated I object to the committee's design for the second barrier anicut. I consider that the one I propose would be the strongest of the two, and would be least liable to injury from the enormous masses of drift-wood which float down in floods, and which, plunging over the main wall of the committee's anicut, might occasionally be dashed with immense force upon the lower wall. I am further of opinion that the description of anicut which I proposed is best adapted as regards construction to the circumstances of the case, requiring a much smaller body of men to be employed, admitting of more perfect organization, requiring less skilled labour, and a smaller establishment, and giving much larger scope for the substitution of powder and steam-power for mere manual labour.

33. Lastly, it should be observed that the whole of the rails, cranes, and other machinery, amounting to about 12,000 £, required for the construction of such an anicut as I propose, have been ordered, and are now on their way out from England. A change of plans now will consequently involve considerable loss.

34. *Improvements to the River Bed between the Barriers.*—Upon this point the committee remark: "In the present state of knowledge of the navigability of the river . . . we deprecate any outlay whatever for groins, without a most careful survey and complete information of the river in all conditions of its stream, large sums may be entirely thrown away." This is of course perfectly true, but no one proposes to construct such works without such surveys and examination. With this remark the committee dismiss the subject; and no notice whatever is taken of the results of the only groin that has been yet attempted on a proper scale on the river, that at the confluence of the River Sebbry below the first barrier. A few notes as to the success or failure of this work, which I can hardly think can have escaped the committee's notice on their way up river, would have been infinitely more to the point than general considerations such as those above quoted.

Have large sums been thrown away upon this work, or has it injured the reaches above and below? It was constructed at the worst known shoal upon the river. It has only been made about half its proper length for want of funds, yet its effect has been most striking. Previous to my going home in 1864, it had almost entirely removed the shoal, and would certainly have done so completely had there been money to extend it and to maintain it in proper order. I have so repeatedly referred to the success of this kind in writing on the subject of groins, that I am surprised the committee should have so completely passed it over. Its effect satisfies me that such works, if constructed with the care and caution I have always recommended, will greatly improve the navigation; they must not be carried too far. When the attempt is made to confine the stream within too narrow a channel, harm will of course be done; but if the stream is not too violently interfered with, but merely helped and directed at the few points where it has a tendency to wander, the effect will be most beneficial. This has been the experience on other rivers.

Nothing of the kind has been attempted on either the Indus or Ganges. Such works would be impracticable on rivers of their class, having constantly shifting banks, an ever-changing channel, and a light sandy bottom. The committee admit that the Godavery is a river of a totally different character, its banks are permanent and well-defined, the positions of the shoals never vary, and the material of its bed is a coarse sand with pebbles. Under such conditions stonework in the bed for regulating the stream may be used with advantage; and I submit that the results hitherto obtained justify this expectation.

35. *General Remarks on Expenditure.*—With regard to this part of the report, I would observe: the cost of tools, plant, and machinery does not appear to me “disproportionate to the expenditure on work.” A large part of such plant must now be available. It cannot fairly be debited to the work already done only.

The committee recommend that, “when the machinery gets out of order, it should be replaced by the ordinary bullock-power machines.” I do not know what description of machinery the committee refer to. Our portable steam-engines have not got out of order, and the committee do not, I apprehend, propose to discard them, and to set bullocks to work the circular saws or the punching machines, or the few other workshop machines. No one who has used a steam mortar-mill would think of abandoning it for half-a-dozen of the common bullock-mills, which do the same work with infinitely more trouble, more superintendence, and in a worse manner.

36. *Losses under the head of Materials, para. 125.*—One of the quarries referred to in this paragraph was opened by myself in 1861, and the tramway laid to it. The other was opened, and its tramway laid by Mr. Schmidt in 1863, after careful examination.

The unsatisfactory results only show the difficulty of finding good cutting stone in that part of the country. Quarries were, in fact, opened at at least six other places, the whole country having been searched for stone, and these two were selected as the most promising.

37. *Unnecessarily Large Establishments, para. 127.*—The total expenditure was 28,47,750 rupees up to December 1865. Deducting from this the expenditure on exploring expeditions and surveys, a large part of which was necessarily for establishments, 1,43,169 rupees, there remain 27,04,581 rupees, of which establishments amount to 4,96,457 rupees, or 18 per cent. This appears to me very moderate, considering the unhealthiness of the climate, and also that, up to May 1863, all the abstracting and booking of the accounts now done in the central office was done in mine.

38. *Colonel Fife's Memorandum on Storing Water, &c. Appendix (B).*—It is not necessary to the purposes for which the present paper has been written to follow Colonel Fife through his interesting memorandum.

It is satisfactory to find that at last one man has been found to come forward and recommend for investigation a scheme which has always been regarded as the wildest and most preposterous of even Godavery projects.

Colonel Fife could of course only refer to past correspondence for information as to my views upon the subject; but, in so doing, he has been betrayed into one or two errors. There is, for instance, really no discrepancy between my rough estimates formed in 1856 and 1862 of the quantity of water required to maintain depths of three feet and five feet in the navigable channels. In the one case the quantity was estimated at 1,928 millions cubic yards, and in the other 4,089 millions, which certainly looks very probable.

Colonel Fife has, however, quite mistaken what I have written about the shoal at the top of the second barrier (paras. 3 and 4).

That shoal is altogether exceptional in character. It is, in point of fact, a part of the barrier, and will be almost wholly submerged when the anicut is built. At no other point along the whole length of the river is any such shoal to be found. It is formed by the action of the barrier on the river-bed above, and may properly be regarded as an adjunct, if not actually a part of the barrier itself.

To argue from its condition on the 1st October that other parts of the river may be impassable on that date, would be as great a mistake as to argue in a similar manner from the condition of the upper mile or two of the first barrier, where there is little or no rock, at the same time of the year.

39. Colonel Fife is unaware that a canal from the upper end of the second barrier to the lower, which he suggests, would only be practicable at an immense outlay. The line for such a canal has been carefully examined, and the levels taken: for the idea is not a new one, but as old as 1855. The result shows that the line is crossed by hills which cannot be turned, but would have to be cut through, and that for a considerable part of the 10 miles or more of canal the cutting would be through rock. This scheme was of course the first that suggested itself to me, and was not abandoned without thorough investigation.

40 I must pass over for the present Colonel Fife's remarks about the third barrier and Wyne Gunga navigation. I must, however, notice the remarks in his concluding paragraph as to the need of further information as to the navigability of the river at the close of the monsoon. “At present” he observes, “there is too little known of the shoals, and it is impossible to state with any certainty what sized boats could navigate the river at the conclusion of the monsoon.” “The passage” backwards and forwards of steamers between Dowlaishwaram and Gollagoodiem, the lower end of the first proposed long canal at the first barrier, is no criterion whatever of the state of the navigation above. Between those two places the river has advantages, which Colonel Fife proceeds to specify.

He omits, however, to notice that this part of the river has most serious disadvantages as compared with the reaches above, 12 miles of it below the confluence of the Sebbry having a fall of two-and-a-half feet per mile, nearly double what is met with anywhere between first barrier and Hingunghât, yet it is undeniable that steamers drawing two feet of water do run upon this part of the river up to January and February, meeting, of course, with detentions at the shoals, such shoals being very few in number, and in part at least attri-

butable to rocks scattered at a few points over the bed, which, more than anything else, cause the channel to silt up. It is further certain that a trip in a steamer drawing two feet, was made from first barrier to second in 1863, in the sixth month of navigation, and that detention from shoals was only experienced at two points, where the shoals were clearly attributable to the few rocks scattered through them. The difficulty which Colonel Fife afterwards refers to in the navigation of the few miles above Gollagoodiem is undoubtedly chiefly attributable to rocks. I have always strongly advised that all the information Colonel Fife requires about the shoals should be obtained by the actual navigation of the river in the shoal season, and this was one reason why I opposed the abandonment of the transport operations commenced by the Madras Government in 1862.

41. Colonel Anderson closes the report with a short memorandum in which he recommends, in opposition to Colonel Fife, and apparently at variance with the advice given in the body of the report, that, in any case, the works at the first and second barriers should be completed before ground is broken at the third barrier. He advises that the river should first be opened to Sironcha, and that, "when the passage of boats up and down the river between that place and Dowlaishwaram becomes an established fact," Government should then take into consideration the propriety of extending the navigation further up river. If Colonel Anderson wishes to ascertain whether boats of certain sizes can navigate the river between the points mentioned, surely this information can be obtained at a less cost than that of removing the obstructions at the two lower barriers. Besides, he has already satisfied himself, as appears from the report, that the river may be navigated by boats of a similar description to those plying in the Delta and on the lower part of the river.

If he wishes to ascertain what amount of *traffic* is likely to spring up and intends to judge from that as to the amount to be expected when the line is opened up into the populous country of Nagpoor, then, I submit, that there is obviously no necessity whatever for waiting for such experience, as it is quite certain that the traffic from Sironcha downwards must be a mere fraction of that which would ensue were the line opened into the well-cultivated and populous districts above the third barrier. Either navigation must be carried into the country which alone is calculated to afford a traffic commensurate with the outlay, or the works had better never have been commenced.

To stop at Sironcha, would be to abandon the main object of the whole scheme, for the cost of carriage by land from the Nagpoor districts down to Sironcha would be prohibitory of any important traffic between them and the coast.

42. Colonel Anderson's illustrations drawn from the case of the irrigation works in the Delta, are inapplicable. The anicuts and main canals there were not constructed merely as an experiment to see whether they would pay, and had the Government judged from the results when the works had been only thus far completed, they would have formed the most erroneous conclusions.

It would be just as great a mistake to carry the navigation to Sironcha, and then stop there without connecting it with the populous districts of Nagpoor, as to have built the anicuts and head-works in the Delta, and then to have omitted to cut the distributary channels, without which the other works must have proved unproductive.

There was nothing of a tentative character in the manner in which the Delta works were carried out. It was first of all ascertained that the scheme would be *sufficiently* remunerative, though few besides the projector were willing to admit that the results would be anything like what they have proved to be. The works were then prosecuted as rapidly as the available funds permitted. Surely, a similar course should be pursued with regard to the navigation works. The committee are of opinion that, even if limited to the employment of boats only, the navigation will, directly or indirectly, yield a sufficient return upon the probable outlay; but in hesitating, as Colonel Anderson appears to do, about the third barrier works, he shows that he altogether fails to appreciate the essential importance of that part of the works to the whole success of the whole scheme, which, without the navigations above that point, would be like an anicut with its head-works and heavy cuttings at head of canals completed, without the distributary canals.

43. But in conclusion I submit that the question as to the capability of the river for navigation for greater or less periods of the year, is now virtually decided by the ascertained fact, that steamers with speed sufficient for the monsoon navigation can now be built with so light a draught, 12 inches, that even if they cannot run for the *whole* year in the unimproved state of the river, they may certainly do so with the aid, during the latter part of the season, of such temporary and inexpensive works as those used on the Ganges for opening passages through the shoals. Such works "bandals" have been tried on the Godavery with sufficient success. A navigation with a minimum depth of three feet was, by these means, kept up one year from the mouth of the Sebbry to Dowlaishwaram up to the 5th February, and this part of the river includes the 12 miles which, as above stated, have a greater fall than any other. It is true that the shoal immediately above the Sebbry did not yield satisfactory results under this mode of treatment, but this has been permanently removed (to the extent to which the work has been carried out) by the construction of a groin. With the aid of such temporary works, I anticipate no difficulty in securing a navigation for steamers of 15 to 18 inches draught for the greater part of the year. But I have never proposed to resort to this imperfect mode of improvement, so long as funds may be available for constructing permanent works of stone in the bed, whose effect would be lasting. The only work of the kind that has been constructed has been

successful.

successful. The obvious course to pursue now is to carry out the same system at a few other places, always selecting the worst shoals for the purpose, and to judge by the result as to the extension of the same system to the whole river. But I submit that the main point, can the river be navigated by steamers for the greater part of the year, is settled; that judging from the experience of several years' navigation of the river with vessels of two to three feet draught, we have ample grounds to conclude that, with steamers of the light draught above mentioned, navigation will be practicable for almost the whole year, even without groins or works of a permanent character for deepening the channels.

F. T. Haig, Major, R.E.,
Superintending Engineer,
Upper Godavery Circle.

Nagpoor, 12 November 1866.

Enclosure 6, in No. 17.

Dated 24th January 1867.

ADDITIONAL NOTE by Major *F. T. Haig*, Superintending Engineer, on the Remarks of Godavery Committee on the 2nd Barrier Anicut.

IN para, 106, page 59, the Committee observe, "Major Haig states that the rock" (of which the river bed is composed on site of anicut) "is not of sufficient hardness to withstand a vertical fall, but we have carefully examined the rock, and believe that any serious injury need not be apprehended." As it appears from the Committee's diary of their journey up-river that they spent one day only at the 2nd Barrier, or at least in the locality of the proposed works, during which time they had to inspect the whole of the ground, the site proposed for the anicut, the quarries, &c., it will not be surprising if, in the examination of the rock composing the bed of the river, nearly three-fourth mile wide, some points may have escaped their notice. One such evidently has been the geological formation of the bed near the left bank; and as this has an important bearing upon the question of the suitability of an anicut with a vertical fall, I append an illustrative section of the bed on the line of anicut showing the nature of the rock met with.

2. The Committee must have been struck with the fact that such an extraordinarily deep channel is met with all along the left bank up to the site of the anicut. A cursory examination affords no explanation of this, but by sinking pits in the river bed, and in the hill side on the left bank, I ascertained the true cause for this particular conformation. The hill, which rises with a steep slope from the water's edge on the left bank, presents to the eye, wherever the jungle permits a view of its surface, only a number of slabs of rock of much the same character as those met with all over the bed, viz., slate more or less altered by heat. The strata of slate forming the surface of the bed have a nearly vertical dip, and it does not take long to see that this alteration of their original position, when first deposited, is owing to the protrusion of the rock forming the mass of the hill on the left bank. The surface of this hill is seen to be covered with slabs of slate, evidently carried up with it in its upheaval.

But when these slabs are removed, the rock underneath is found to be of a felspathic kind, in a state of almost complete disintegration, soft enough to be cut with a spade. And similar investigation detects the same rock right down to the water's edge and into the deep channel below the site of the anicut, rendering it probable that the depth to which this channel has been cut is owing to the softness of the material composing its bed. This probability becomes matter of certainty when the river bed itself, for a width of 100 yards out from the left bank on the line of the anicut, and for half a mile above, is examined. As soon as the surface stones are removed, the soft white felspar is seen, and pits have been sunk in it at several points. It has been partially hollowed out above the anicut for the distance just mentioned, and in some places deep holes have been cut in it by the floods, but the channel thus formed being almost blocked up at the lower end by some large masses of hard igneous rock, the erosion of the bed has not proceeded to the extent it has in the deep channel below the anicut. This decayed felspathic rock extends out under the proposed site for the locks, and sluice, and guard-walls. How much further it extends across the bed is not ascertainable at present. About half way along the site of the sluice-wall, the slate rises, and thenceforward alone meets the eye across the whole of the rest of the river-bed.

But the existence of a deep channel not much farther out into the river (about one-fourth of the way across) the bed of which, at a depth over 30 feet below the bed on both its banks, is found to be sand in summer, showing that the real bed is at a still greater and as yet unknown depth, leads to the suspicion which would certainly need verification before a masonry anicut, 40 feet high with vertical fall, could be built upon it, that the soft felspar may underlie the slate there also, and that the surface of the felspar may possibly be something like that shown by a dotted line in the Section.

3. It is not necessary that I should express an opinion as to the extent to which such a discovery, if made, or even the ascertained fact of the existence of this rock near the

left bank, would affect the question of substituting an anicut with vertical fall for the one which I proposed, but as such an anicut, if decided upon, would be built on the responsibility of the Committee, and not on mine, it is right that so important an element in the question should be brought to their notice.

4. With regard to the doubt expressed by the Committee as to the possibility of making a rough stone anicut sufficiently water-tight to retain the water above it level with its crest in the summer months, I would offer the following considerations in addition to what has already been said in the body of my memorandum.

The Committee point out that only 2,300 feet in length of the anicut will be about 22 feet high, and that of the rest, the greater part is less than 12 feet, while 170 feet only will be exposed to a head of 40 feet of water. The whole work rests upon perfectly impervious rock. Now, as the quantity of water passing over this anicut in the hot months will be almost the same as over the Dowlaisweram anicut (for the contribution of the Sebbry at that time of the year is trifling), it will be appropriate to inquire whether any difficulty is met with in retaining the water at a sufficient level at the latter work. The Dowlaisweram anicut has a height of solid masonry of $14\frac{1}{2}$ feet.

For a length of $2\frac{1}{2}$ miles, or 13,000 feet, it rests upon a bed of coarse sand of unknown depth, through which an incessant percolation takes place, the water thus passing *under* the anicut, and rising to the surface again below. There is at the same time a constant drought by the three main irrigation canals of the greater part of the available supply entering the pool above the anicut.

Yet the water only falls a foot or two below the crest in the hottest weather.

Compare this with the proposed anicut at the 2nd Barrier. There, none of the available supply will be drawn off by side canals; all the water coming down river must pass either over the anicut, or through it; it cannot pass through the rock underneath.

Yet there we have an anicut 4,000 feet only in length with an average height of 18 feet, resting on a perfectly water-tight foundation, against an anicut of 13,000 feet in length, resting upon a fathomless depth of coarse porous sand, with the additional drain upon the pool above it of the greater part of the available discharge to supply the irrigation canals.

Can any one suppose that there would be any great difficulty in retaining the water at its proper level above the 2nd Barrier anicut than is found at Dowlaisweram; or rather, can there be any comparison between the difficulty in the two cases?

As regards the former work, it is easy to calculate the area over which leakage would take place on the Committee's supposition.

The most it could possibly be would be the length of the anicut multiplied by its mean height, or about 70,000 square feet.

But every one who has seen an anicut knows that this would be far in excess of the truth, as the bed above would silt up to within a few feet of the crown all along; so that, in reality, the leakage surface would be only a fraction of that just mentioned.

But how are we to estimate the area of the leakage surface above the Dowlaisweram Anicut? No one can say through how great a breadth of the sand (for there is no *mud*) above that work percolation takes place. It undoubtedly may extend to a distance of several hundred feet from the front wall. Even if we reckon on 100 feet only, we should have an area of $13,000 \times 100 = 1,300,000$ square feet of porous surface constantly leaking under a head of 12 to 14 feet. The porous surface then, in this case, cannot be less than 20 times that of the 2nd Barrier anicut, even if the whole of the front slope of the latter were exposed, or 40 times as great if half the height of the anicut were silted up. And in addition to this enormous disproportion between the leakage area at the two works, there is the drain by the canals at the lower anicut of nearly the whole of the available supply for irrigation.

Can it be supposed, under such circumstances, that there would be any difficulty in making the 2nd Barrier anicut sufficiently water-tight?

5. I cannot but think that the Committee have dealt somewhat hastily with the question of the 2nd Barrier works, and that fuller investigation on the spot, and fuller consideration of all the circumstances, would have led them considerably to modify the opinions they have expressed.

Enclosure 7, in No. 17.

MINUTE by Colonel the Honourable Sir *H. M. Durand*, C.B., K.C.S.I.

GODAVERY NAVIGATION PROJECT.

I HAVE read attentively the printed papers which accompany the Secretary's note, namely, the Report of the Commission, and the Minutes of Mr. Temple with Major Haig's two Memoranda, and I have also referred to preceding papers.

2. The Report of the Commission and the Minute of Mr. Temple on that report concur in one main and essential consideration. The Commissioners point out that "the circumstances of the Godavery have changed considerably since the project was first brought forward. The works were pushed on in the expectation that they would give the means of

of transporting the cotton crop of the Nagpoor Provinces to the coast, but the object is now accomplished by the Great Indian Peninsula Railway," and they give reasons why "it is vain now to expect that the Godavery navigation will draw any of the cotton from Berar, especially as the terminus of the navigation will be at a considerable distance from the cotton field, while the railway passes right through it."

3. After a careful estimate of the actual trade and revenue of the Central Provinces, with reference to which Mr. Temple in paragraph 38 of his minute on the report, observes that "any sort of calculation depending on aggregate statistics of the whole Central Provinces would be much too favourable to the Godavery project," the Commissioners arrive at the conclusion that the Government will not reap any considerable direct return from the expenditure, and that it would be unreasonable to expect any considerable traffic on the river, under a period of 10 or 15 years *after it shall have been opened for navigation*. As the works, if executed, must take a long period in completion (to be moderate say 10 years), it follows that no return need be expected for a quarter of a century. With this view Mr. Temple expresses a general concurrence, which he qualifies, however, with an assurance that if the navigation shall be really well opened, there will be hundreds of boats and thousands of tons of merchandize within a brief period, and then tolls may be realized. As no guess is hazarded as to the time that will elapse before this flow of tons of merchandize down the Godavery can take place, it is fair to take the general concurrence with the Commissioners as the positive, and the future and sanguine view as the hypothetical, and to regard the opinions of the Commissioners and of Mr. Temple as practically in harmony on this essential point, one which Major Haig abstains from speculating upon in a tangible form, except that he regards the Godavery project as likely ultimately to compete with Great Indian Peninsula Railway, though when, is not stated, and argues that the navigation should be carried up at least to Hingunghât, be connected by rail or canal with the cotton country to the west of the Wurda, and expresses his belief that neither the Government nor the manufacturing community in England will consent deliberately to abandon the most important cotton tracts in India to a railway monopoly, and deems it of the utmost importance that the navigation should be placed in a position to maintain a constant check upon the railway rates, and for this reason alone it should be carried right up into the cotton country.

4. We are thus brought face to face with a project of which no one speaks as at all likely to be remunerative, and which will take a quarter of a century before it develops trade or traffic on the Godavery. It is a low estimate to say that 3,000,000 sterling must be expended before the works at the Three Barriers and the storage works on the Weingunga are finished; probably instead of 3,000,000 £. the expenditure will be a good deal more, and the return on this large capital will avowedly be nominal for a very indefinite period of time. The Commissioners, judging from their report, were painfully alive to this, but reluctant to arrive at the inevitable conclusion that the work was to all practical purposes wholly unremunerative, shrunk from an absolute condemnation of the project, and pronounce a verdict hardly in accordance with their own summing up. Mr. Temple and Major Haig take advantage of this circumstance and criticize the report with the greater show of reason on their parts in consequence of the latent inconsistency of the summing up and the finding. The Commissioners avoided such a logical conclusion as was arrived at in the case of the Chittagong and Akyab Road, and the Tibet Road, for both of which fully as much could be said, and was originally said, as for the Godavery project, and with rather more probability in favour of anticipations doomed to have no chance of realization in consequence of the trenchant, though in my opinion reasonable, decision of the Government of India in both cases. The Commissioners take a middle course, and though they do not fall into the error of thinking that a quarter of a century hence the Godavery works will enable navigation to compete with railways, which having that start are not likely to lose it, and cannot fail to ramify so as to tap directly any region worth tapping, yet hampered by the conviction that steam traffic will not pay, and sceptical as to the value of prophetic generalizations as to movement of troops, stores, &c., by such a route, and to such a part of India, they persuade themselves that a boat traffic will arise, and strive to economise by curtailing the project of the dimensions of locks, &c., which have in view steam traffic and thousands of tons of merchandize. Now if Government is prepared to spend from 3,000,000 to 5,000,000 or 6,000,000 sterling on the Godavery and Weingunga works, and to wait a quarter of a century for any return on this outlay, it certainly seems inconsistent with the magnitude of the enterprise to pare down the size of the locks, so as practically to unfit them for steam traffic, and thus to cripple the project on a vital point, whilst at the same time incurring a gigantic outlay in behalf of mere boat traffic. If it be resolved to embark on such an expenditure, and to complete the undertaking to which Government has been partially committed, by allowing immature schemes to break ground and drift into uncontrolled and unestimated outlay, then it hardly seems expedient to throttle the project by rendering its lockage inefficient. On this point, therefore, I concur with Mr. Temple, though I have no objection to Colonel Dickens' proposed mode of solving the difficulty, which mode, if I understand it correctly, would however scarcely effect much saving on Major Haig's scheme of locks, which, on the whole, I prefer.

5. With regard to the difference of opinion between the Commissioners and Mr. Temple on the subject of adopting the major or the minor canal projects at the First Barrier, it

appears that, on the short canal 8½ lakhs have been already expended, on the long canal 11½ lakhs, and that according to the estimates, probably in neither case very reliable, though for obvious reasons, more so in the case of the short than of the long canal, the balance to be spent is 8½ lakhs to complete the short canal, and 23 lakhs to finish the long canal. From the peculiar felicity which attends at every step these Godavery works, Government is thus placed in the dilemma, whatever its decision, of sacrificing, at least for the present, a very considerable outlay. The Secretary's calculation is based on existing estimates made some time back, and, in the case of the long canal, not examined by any one; the calculation can only be regarded as a rough approximation; and to judge of the future by the past, making allowance for the conditions of both projects, Government will be lucky if the short canal be completed with an outlay of 10 instead of 8½ lakhs, and the long canal with an outlay of 30 instead of 23 lakhs. From a purely economical point of view, therefore, considering that trade and portage of trade have to be created, the balance is in favour of the short canal. But it appears a condition, so to speak, of the whole Godavery project, to embark on this costly enterprise, putting aside those ordinary economics which would condemn or defer *sine die* the undertaking, and assuming a genial faith in the returns and rewards of the future, to take a very imperial view of the duty of Government to accomplish all in its power for the benefit of the Godavery navigation. There can be no question that from this aspect the long canal is the preferable way of dealing with the first barrier. Prudential, but relatively to five or six million of total outlay, petty economics point to the short canal; the imperial view, on which alone this large expenditure is excusable, point to the long canal. Vague and hypothetical drafts on the future impose upon no one, and therefore as it is only by a rejection of ordinary prudential calculations that I can bring myself to envisage the outlay necessary for this project, only by a broad departure from the common rules which, to a public man, are imperative in the application of Government money to remunerative works, that I can bring myself to entertain this vast, and for a long period profitless, diversion of public funds, it seems illogical to swallow the camel and strain at the gnat. If this enterprise is to be prosecuted as one for some reason or other of imperial necessity, and from first to last in defiance of ordinary prudential motives, why then it is in harmony with the general conception to disregard petty economics, and to make it as complete as possible? I think Mr. Temple and Major Haig more logical from this point of view than the advocates for the short canal.

6. With respect to the works at the second barrier, I should be doubtful of the proposed modifications by Colonels Anderson and Fife. Major Haig has studied the details of the *locale* much more than it was in the power of the Commissioners to do, and I am disposed to prefer his designs.

7. Upon the question of carrying on the works at the first and second barrier simultaneously, I adhere generally to the opinion expressed in my note of the 26th August 1865, which should be printed with this Minute. I would, however, so far modify the views therein expressed consequent on the plant of machinery, &c., brought out from England by Major Haig for the prosecution of the works at the second barrier, that I would leave it to the discretion of Major Haig not to weaken the vigorous prosecution of the works at the first barrier, by any diversion of means to the second barrier, that could be concentrated usefully on the first barrier. Having the machine, &c., for the second barrier, none but the engineer on the spot can judge well whether it can at once be advantageously employed without detriment to the general concentration of means on the operation at the first barrier. The case was somewhat different when none of this plant of machinery was on the line of the Godavery.

8. The road from the foot of the third barrier, which may be, as proposed by Mr. Temple, a fair-weather line, seems a necessity pending the inquiries as to the third barrier, and the investigations for the navigation of the Weingunga storage projects, &c., surveys of both the proposed lines of road, viz., that from Chanda to Seroncha, and that from Chanda to Mogallee should be at once called for.

9. Colonels Anderson and Fife deserve to be thanked for their able and lucid report. Nothing can be more desirable than the tone of moderation and considerateness which pervades their paper.

10. I must conclude this Minute with the remark that whilst admitting that it is the duty of a Government like this to undertake great public works of imperial necessity without always regarding too closely whether they promise to be immediately remunerative or not, yet that I think this principle has its limits, and that the history of these Godavery works and their progress is an instance of a clear transgression of these limits. Such an instance as this shows how imperative is the duty of an efficient and timely-check on the part of the Government of India on the introduction of immature and ill-considered schemes. It is not fair to the general finances of the empire, nor equitable to the many projects of immediate and crying utility which have been repressed for want of means, though well investigated and maturely planned, that schemes exactly the reverse of being either well investigated or matured, and involving an enormous outlay, should anticipate both sanction and resources by a process which practically commits the Government, and prevents the efficient exercise of that control which is essential to a proper and fair application of the public money. Manifestly there has, in this instance,

been

been already an outlay disproportionate to the results attained, and the prospects of the future can hardly be considered as very encouraging either in this respect or any other. There is a reluctance on the part of the Government of India to withdraw from any public work once undertaken, yet it did not hesitate to discontinue the expenditure on the Arracan Province Road and the Thibet Road, rather than prosecute very costly but problematically remunerative works; and it even (unwisely in my opinion) contracted expenditure on such works as the Ganges Canal rather than that the charges of the Department of Public Works should press on available resources. In striking contrast with these measures has been the license given to expenditure on the Godavery works, and the practical result is that it lands the Government in the dilemma of either submitting to the dead loss of the 30 lakhs expended, or of encountering an outlay of from three to five or six crores of rupees for works which, whatever the ability with which Mr. Temple endeavours to invalidate the conclusion of the Commissioners as to their ultimate utility, are problematical to a degree that no explanation on the part of Mr. Temple, or anyone else, can divest the works of the character of utter uncertainty, or confer upon them a colour of reasonably prudent State economy. It is without being in the least imposed upon by vague common-places as to the development of trade on the Godavery, transport of stores, troops, &c., by such a route, that I in some sense prefer Mr. Temple's and Major Haig's views. Railway enterprise is not likely to lie dormant for the next 20 or 30 years, and it will open out the Central Provinces and the Nizam's dominions with greater rapidity, and more certainty of success than can attend the sinking of capital in the Godavery, Wurda, and Weingunga works and storage schemes, but the Home Government decided the question in favour of the prosecution of these Godavery works, and what chance the project has of slow ultimate success will depend materially on bold and costly works, and a thorough and complete surmounting of difficulties. Half measures are not in place in such a scheme. Without what may be termed bold engineering the project, viewed as a speculation, has small chance of success, and I foresee very heavy, indeed extravagant outlay, before the scheme can be completed.

23 February 1867.

H. M. Durand.

NOTE by Colonel the Honourable Sir *H. M. Durand*, C.B., dated 26th August 1865, referred to in paragraph 7 of his Minute on the Godavery Navigation Works, dated 23rd February 1867.

WHEN this project was first submitted to the Home Authorities, it was represented by the Madras Government on the reports of Lieutenant Haig, Colonel Cotton, and Colonel Faber, "that the hindrances to navigation from rocks in the Godavery, Prahita, and Wurdah may be removed at a cost of 30 lakhs of rupees, and navigation opened for 473 miles for three-fourths of the year, being at the rate of 6,180 rupees per mile.

2. It now appears that 286,075*L.* have been spent, that is close on the aggregate amount of the original rough estimate of 29½ lakhs; and that this large expenditure has produced no adequate result.

3. Yet it seems that this outlay has been concentrated on the works of the first barrier; that even there not half the work required has been done; and that none of the other works have as yet been touched.

4. It is difficult to conceive a more thoroughly unsatisfactory result than is thus set forth; and as, when the project was first brought forward in the Council of the Secretary of State, I urged that nothing should be sanctioned without the previous submission of well-considered plans and estimates, and the revision of these by the Government of India; so now before we embark on a prospective expenditure estimated at 487,000*L.*, say half a million, I would urge the same thing.

5. The Secretary calculates that in all the cost of the completed project will probably not be under 800,000*L.* I apprehend, judging from the past, that it will be very considerably more than this. A million and a quarter will probably be nearer the actual expenditure before all is accomplished that is necessary to be done in order to attain the very moderate aim of the Government of India. It must be remembered that when this object shall have been attained, the project will be open to the objection of being a very imperfect one; and that in all probability there will be a cry that it should be completed, and that after spending 1½ million on securing four or five months' navigation, it is bad policy not to spend another million on storing water, and rendering the navigation practicable throughout the year. I am confident that this will be the issue; and, therefore, before Government is committed to an expenditure so serious in amount, I think every precaution should be taken that it be not inconsiderately and inefficiently incurred.

6. Upon this point, the Secretary, when he remarks that "although there is little apparent result from the large expenditure heretofore incurred, much knowledge and experience has been gained which may now be turned to account on the works," seems to me to take a rather more favourable view of affairs than circumstances actually warrant. The oscillations of views and changes of plans indicate anything but a stable and satisfactory appreciation of the best mode of solving the problem, the solution of which has

been entered upon. Government is not yet in possession of matured plans and estimates for the works of the first barrier.

7. There has been similar vacillation as to the works for the second barrier.

8. There is no estimate for the works between the second and third barriers; none for the road to Chanda.

9. It really would seem that but for the expenditure of 286,075 *l.* the project is very little more advanced than when in the Council of the Secretary of State, I pressed for no action without well-considered plans and estimates. I therefore demur to the prosecution of the works on the whole line of communication simultaneously. I should like to see one section, that of the first barrier, done, and well done first, before advancing to a second.

10. As all labour has to be imported from a distance, I think there would be great advantage in concentrating available means on one section, and no small economy, not only by avoiding the competition in the labour market emanating from distinct centres of works, but also by the small and more compact establishments necessary for a single section.

11. If there were a large mercantile population on the banks of the Godavery awaiting with teeming produce the opening of the line of communication, it might be advisable to risk a similar amount of money to that already incurred on imperfectly matured operations; but there is no such excuse for haste; the traffic has to be created, and any one who knows the line of country must be aware that it will take time to call into life that of which there is now little or no trace. Except in the anticipation of a distant future, the proceeds of the undertaking are not encouraging, and as the returns must be slow and remote, there is no inducement to precipitate progress at the risk of the soundness of the engineering operations.

12. I am confirmed in this view by the very sensible observation of the Secretary in his "concluding remarks." From these it is manifest that the Government are not sure whether there be a consentaneousness of purpose between the Government and the engineer charged with devising the works necessary for the execution of the purpose.

13. With respect to indispensable data, it will be observed that Government are actually not in possession of detailed information as to the precise state of the river below the first, and between the first, second, and third barriers, at least this information, if it exist at all, does not exist in an available, accurate, practical form.

14. I am, therefore, in favour of concentrating effort and expenditure on a single section, viz., the first barrier, after the receipt and approval of full and specific plans and estimates, but not before.

15. I should also wish that a Commission were appointed of three independent and competent officers, unconnected with Madras or the Central Provinces, to examine and report upon—

1st. The work done.

2nd. The work in progress.

3rd. The work to be executed in order to complete the project.

16. As yet everything has been crude, costly, and unsatisfactory. Prospectively matters are not promising; and though the project having been begun may have to be carried out to completion, it will not be so immediately productive that it should have a preference over other reproductive works from which the return is more certain and less in a remote future, but of which from want of money we are staying, if not starving, the development.

26 August 1865.

H. M. Durand.

Enclosure 8, in No. 17.

(No. 195 c, dated 8th March 1867.)

From Colonel *C. H. Dickens*, R.A., Secretary to Government of India, Public Works Department, to Chief Commissioner of Central Provinces.

I AM directed to acknowledge receipt of your communications as per margin, on the subject of the Commissioner's Report, and the further prosecution generally of the Godavery Navigation Works.

2. The whole subject will be referred for the consideration of the Secretary of State, but meanwhile I am to convey to you the following orders as to the works to be carried out at once.

3. The

3. The Government of India authorise the completion of the first barrier project with the short canal, as recommended by the Commissioners.

4. The Governor general in Council agrees with you that locks for steamer traffic should be retained in the project, but leaves it to your decision whether smaller locks should not also be provided for boats in view to the facility of working. It may be worth while to incur some additional outlay for this object, and thus to carry out the views of the Commissioners in regard to boat traffic, while not acting in opposition to your views in regard to the use of steamers.

5. The Governor General in Council sanctions the estimate amounting to 11,34,139 rupees, for the second barrier works, according to the design recommended by Major Haig, and desires that the work may be pushed forward with all prudent expedition. In departing here from the recommendation of the Commissioners, the Governor General in Council is sensible of the value of their opinion, but as the subject is one on which there are strong grounds for an adverse opinion based on Major Haig's careful study of the subject, and as preparations have already been made for carrying out his project, it is considered best to proceed with that at once, to avoid further delay and discussion.

6. In all other points than those above noticed, you are authorised to do what is necessary for the early opening of the communication up to the foot of the third barrier, subject only to the restriction that no work is to be put in hand until a detailed estimate has been submitted and approved by the Chief Engineer of the Central Provinces. Such estimates as require the sanction of the Government of India should be submitted in due course, but the sanction need not be waited for when it is desirable to proceed at once with the work.

7. It is observed that Major Haig questions the conclusions drawn by the Commissioners and others as to the rates of work and cost of construction. On this subject the Government of India desire to have your opinion, after full report from the Controller and Chief Engineer, and further consultation with Major Haig himself. It would seem to the Government of India that Major Haig has overlooked or under-rated the effect of the difficulties and of the arrangements for collecting labour. When all the advances, including payments for labourers in progress to join the works, losses by absconding, owing to outbreaks of cholera and other causes, and the hutting, maintenance of sick, and other expenses are added, no doubt the cost of the work will be found very much larger than would be due to the mere rate of wages paid to artificers and labourers. Possibly, also, under the circumstances of the case, the quantity of work to be obtained from each man may be less than usual. This subject should be carefully considered in the light of past experience, and by the aid of the accounts of past work; and all the estimates should be finally revised according to the result of your investigations on the subject.

8. The prosecution of the work beyond the foot of the third barrier must await the orders of the Secretary of State, whether as regards the question of constructing a road, or continuing the navigation works. The surveys and estimates for both should, however, be proceeded with as early as possible, under the following arrangements, the necessary establishments being organised at once.

9. The Government of India are inclined to agree to your views as to the road to Chanda. But as it will be necessary to wait for the Secretary of State's orders, it will be best in the meantime to prepare and submit estimates for the early construction of fair-weather roads by both the routes discussed. If this be done promptly, action may be taken at once on receipt of the Secretary of State's orders.

10. The estimate for the extension of the navigation works should, for the present, be strictly confined to the opening out of third barrier, and continuation of the navigation to Hingunghât. The increase of the water-supply of the river by storage, and the extension of the navigation up the Wurda and Wynegunga must be entirely suspended until the third barrier estimate is completed, or until further orders are received from the Secretary of State.

11. The scheme for extending the navigation up the Wynegunga, on which you have submitted a separate Minute, will be referred with the other papers to the Secretary of State.

12. The Government of India rely upon your exertions to carry out the arrangements now ordered; and to apply in due form for the necessary establishment. You need not, however, wait for sanction before carrying out such arrangements as may be practicable with the officers and subordinates now under your orders, or whose services you may be able to procure.

13. The Governor General in Council requests that you will convey to Lieutenant Colonels Anderson and Fife the cordial thanks of the Governor General in Council for the valuable report they have submitted.

14. The sanction accorded in para. 5 has been registered as No. 114 C, of 1866-67.

— No. 18. —

(Public Works, No. 86.)

To His Excellency the Right Honourable the Governor General of India
in Council.

Sir,

India Office, London, 14 September 1867.

Para. 1. YOUR Excellency's Despatch, dated 8 March (No 36) 1867, together with the accompanying papers, on the subject of the Godavery navigation project, have received my careful consideration in Council.

2. After a perusal of the papers containing information respecting the districts comprised in the basin of the Godavery and its affluents, I am led to concur with you in the opinion that, on the whole, the arrangements which have been made by you for the prosecution of the works is the most desirable course to pursue. A river communication connecting the Central Provinces with the sea must be beneficial to the people of that part of India, and, if successfully carried out, must eventually prove advantageous to the State.

3. At the same time, if the Godavery works are to be completed, all half measures should be avoided. The ultimate success of the project depends upon the adequacy of the scale on which the works are constructed.

4. I now proceed to communicate my views on the various points which have been referred to me by your Excellency for decision.

5. The works should, undoubtedly, be adapted for steam navigation, and the locks should, therefore, be constructed with a view to the passage of steamers. But I cannot concur in preferring the short canal at the first barrier to that advocated by Major Haig and Sir Richard Temple. The larger project for a canal 20 miles long, from Doomagoodium to Golagoodium, is admitted to be more complete and certain than that recommended by the Commissioners, while the smaller project, though less expensive, and involving the construction of a canal only five miles long, also includes the necessity of blasting the rocks in the river bed for a considerable distance, a doubtful and difficult operation, both the cost and effect of which are uncertain.

6. Your orders to proceed at once with the completion of the works up to the foot of the third barrier, including the second barrier works according to the design recommended by Major Haig, have my full approval.

7. With regard to the further extension of the project, I am of opinion that there should be no delay in completing all the necessary preliminary investigations, in order that your Excellency's Government may be in a position to sanction the prosecution of the works on the upper part of the Godavery system as funds become available in future years. Your orders, therefore, for the submission of the third barrier estimate should be carried out at an early date, as well as those for the survey of the line of the Wurda and Wunna up to Hingungghât, and of the Wyngunga and its tributaries. Sir Richard Temple's interesting Report shows it to be very desirable that the latter river should be included in the Godavery project, both on account of the importance of the Wyngunga Valley, and because the navigation would thus be brought into the immediate vicinity of Nagpore.

8. The storage of water in reservoirs, in order to increase the natural stream of the Godavery during the dry season, is stated to be an important part of the project; and I perceive that an engineer of special qualifications has been already employed in searching for sites, with some success. These investigations should be completed, and orders should be given for the survey of the sites which are suitable for reservoirs within the basin of the Godavery. It will be for your Government to determine upon the sites where such reservoirs should be formed.

9. A considerable time must elapse before the extension of the navigation beyond the third barrier can be completed, and, in the meanwhile, a road will not only be useful during the execution of works which may ultimately be

approved,

approved, but will also render the works lower down the river immediately available for traffic. I am, therefore, willing to sanction an expenditure of one lac in the construction of such a road from Mogellee, at the third barrier, to Chanda.

10. The territories of the Nizam receive as much benefit from the opening of the Godavery as our own, and I shall be glad to be informed of the results that have attended any representations that may have been made by the Resident to his Highness's Government on the subject. It is not unreasonable to expect that, in consideration of the benefits that will accrue to his dominions, the Nizam's Government should take some steps towards opening roads as feeders to the river, and relax the levy of duties on food and other articles exported for consumption by the people employed on the works.

I have, &c.
(signed) *Stafford H. Northcote.*

— No. 19. —

(No. 64, Public Works.—Government of India.—Public Works Department.)

To the Right Honourable the Secretary of State for India.

Sir,

Fort William, 8 April 1867.

WE have the honour to forward, for the information of Her Majesty's Government, the Progress Report of the Godavery Navigation Works for the half-year ending 31st October 1866.

Civil Works.
Miscellaneous.

We have, &c.
(signed) *John Lawrence.*
H. S. Maine.
W. Grey.
G. N. Taylor.
W. N. Massey.
H. M. Durand.

Enclosure 1, in No. 19.

(No. 83.—1179, dated 2nd March 1867.)

From Colonel *W. Maxwell*, R.A., Secretary to Chief Commissioner of Central Provinces in the Public Works Department, to Secretary to Government of India, Public Works Department.

I AM directed to forward the following papers, being the Second Half-yearly Progress Report, ending 31st October 1866, on the Upper Godavery Works :

Statement, showing progress and cost of works in Upper Godavery Circle.
Three tracings showing state of works.

Superintending Engineer, Upper Godavery Circle, No. 131, of 12th February 1867.

Officiating Superintendent, Transport and Supply Department, No. 813, of 9th January 1867, on the operations of his Department.

2. In submitting these papers, the Chief Commissioner would observe that the progress in general appears to be as satisfactory as circumstances permitted.

STATEMENT showing PROGRESS and Cost of WORKS in UPPER GODAVERY DIVISION during Half-year ending 31st October 1866.

NAME OF WORK.	Quantities.		Per-centage of Work done.		Cost.		Per-centage of Cost of Work done.		Rates per 100 Cubic Feet.			Excess over, or Saving on, Estimated Rates per Cent.		REMARKS.			
	As in Estimate.	Done during Half-year.	Total done up to 31st October 1866.	During Half-year.	From 30th April 1866 up to 31st October 1866.	As in Estimate.	Actual of Work done during Half-year.	Actual to 31st October 1866.	During Half-year.	To 31st October 1866.	As in Estimate.	Of Work done in Half-year.	Of Work done from 30th April 1866 to 31st October 1866.		During Half-year.	Up to 31st October 1866.	
1. Ancient masonry	782,675	-	355,603	-	46.72	Rs. 2,20,914	Rs. 123	Rs. 1,42,040	.05	64.29	28.22	-	38.84	-	+37.60	The expenditure shown on the anicuts for the half-year is composed of workshop charges for opening and closing sluices, &c., &c.	
2. Sluice wall	200,185	-	184,527	-	92.17	71,430	176	80,681	.24	112.95	35.68	-	43.72	-	+22.55	The half-year's expenditure includes charges on opening and closing gates, construction of four iron-ladders for top of sluice and other workshop charges.	
3. Head-lock	256,962	22,846	234,813	10.06	91.38	88,457	15,078	95,158	17.04	107.57	34.42	38.34	40.52	+69.38	+17.71	The progress on the head-lock during half-year ending 31st October has been limited according to the rate at which the requisite cut-stone for the flooring and hollow quoins could be supplied at, large portions of this being brought in boats over the barrier, a distance of 15 miles, unloaded and brought by tramway to the lock. A portion of the hollow quoins-stones were brought by tramway from the Nurapoor, about eight miles, and the stones for the coping of the walls from Manoopoor by boats, a distance of 12 miles. The masonry work of the lock is now complete, with the exception of a small portion of the side-walls of the flood and tail gate bays, and considerable portion of the coping, and the cut-stone sill and their backing. The quantity of cut-stone laid during the half-year is 2,242 cubic feet, and the number of square feet dressed 7,384. The work was unavoidably delayed and inconvenienced, and much expense incurred by slip and the necessity of constantly keeping pumps at work.	
4. Gungole Canal earth-work	Detailed estimate for short canal not submitted.	2,961,462	11,149,207	-	-	-	28,922	1,03,979	-	-	-	Per 1,000 9.77	Per 1,000 9.33	-	-	-	Canal to Gungole.—There remains to complete the excavation of canal only one yard in depth, for a distance of 84 chains, and the excavation of the entrance to the head-lock and tail-locks.
5. Flood bank	-	1,853,134	4,965,641	-	-	-	9,200	34,984	(See marginal explanation.)	-	-	Per 1,000 4.96	Per 1,000 7.04	-	-	-	Flood Bank.—The flood banks are finished (with exception of a few portions which require to be slightly raised) from the high ground at Doonagoodium to site of tail-lock at Gungole. In the actual cost of flood bank a sum of 1,918 rupees, omitted in previous half-yearly reports, is included.
6. Protective works at Lanka	173,890	131,024	195,306	75.35	112.31	23,672	20,095	26,457	84.89	111.77	13.61	15.33	13.54	+24.9	-0.48	-	Protective works to Lanka are finished.
7. Accommodation for Establishment	-	-	-	-	-	-	61	40,007	-	-	-	-	-	-	-	-	Includes Miscellaneous charges against Tools and Plant which have not been included in amounts shown in Monthly Progress Reports.
8. Tools and Plant	-	-	-	-	-	-	5,665	-	-	-	-	-	-	-	-	-	Includes 50 rupees per cent., a charge not included in Monthly Progress Report.
9. Manufacture of stock	-	-	-	-	-	-	4,842	-	-	-	-	-	-	-	-	-	-
10. Repairs of tramway	-	-	-	-	-	-	5,021	2,250	-	-	-	-	-	-	-	-	-
11. Miscellaneous charges to Labour	-	-	-	-	-	-	25,182	-	-	-	-	-	-	-	-	-	-
12. Cemetery, Doonagoodium	3,158	3,094	3,094	97.97	97.97	1,994	805	805	75.58	73.58	34.64	26.02	26.02	-24.9	-	-	Finished.
13. Cantonment roads, Sironcha	-	-	-	-	-	2,113	2,791	2,791	-	-	-	-	-	-	-	-	Finished.
14. Detached buildings to Court House, Sironcha.	-	-	-	-	-	830	830	830	-	-	-	-	-	-	-	-	Finished.
15. Solitary cells, Sironcha	-	-	-	-	-	1,263	437	1,263	-	-	-	-	-	-	-	-	Finished.

ABSTRACT of First Five Items in the foregoing TABULAR STATEMENT.

Masonry	-	-	-	1,220,322	25,846	755,033	2,08	69.90	3,80,801	15,377	3,17,879	4.03	83.47	30.71	50.49	40.49	+37.06	-
Earth-work	-	-	-	-	4,814,926	16,114,008	-	-	-	38,122	1,36,063	-	-	-	7.08	6.63	-	-

(No. 131, dated 12th February 1867.)

From Major *F. T. Haig*, R.E., Superintending Engineer, Upper Godavery Circle, to Secretary to Chief Commissioner of Central Provinces, in the Public Works Department.

I HAVE the honour to submit the Report of the operations of the Transport and Supply Division for the half-year ending 31st October 1866, with the following remarks:—

2. The functions of this agency are, as the Chief Commissioner is aware, two-fold, the supply and sale of provisions to the workpeople, and the transport of food, stores, and materials for the works.

3. The Officiating Superintendent treats first of the Supply Branch.

It appears that the total amount of cash transactions during the half-year, viz., of receipts and payments, was 1,27,164 rupees.

			Rs.
The establishment employed cost	-	-	3,529 permanent.
"	"	"	1,437 temporary.
TOTAL			Rs. 4,966

or nearly 4 per cent. upon the total cash transaction.

As the sale of provisions is let to a contractor at a commission of 4 per cent. upon the receipts, it would appear that the cost of the establishment engaged in the purchase and supply is in the same ratio to the expenditure.

4. The total expenditure, however, upon the Supply Branch of the operations amounts to 10,224 rupees, which includes an item of 5,117 rupees for "labour and materials," and 141 rupees for carriage. I am not able at present without a reference to the Officiating Superintendent at Cocanada, which would cause much delay to explain the precise nature of these charges.* It appears, however, that those for landing and deposit of goods in the Government stores are debited to this head, as well as the cost of the men retained in the stores for making up bags, weighing, and selling, &c.; but there must be other items of charge with which I am not at present acquainted.

With the Central Office of Account at Nagpoor, and that of the Officiating Superintendent of the Supply Department at Cocanada, it is impossible for me to state exactly the financial result of the operations of the half-year. I hope, however, that when the year closes I shall be better informed upon this subject.

At present it is only by a special reference either to your own office, or to the Controller's at Nagpoor, or to the executive officers here and at Cocanada, that I can learn either the amount of the estimate for, or of the expenditure upon, any work in any Department of the operations.

Mr. Dennison, however, points out in his paragraphs 8 to 12, that the rice consumed was, in consequence of the failure of the crops in the Bustar country, whence our supplies were largely drawn in ordinary years, purchased on the coast where famine prices more or less prevailed.

There is no doubt, therefore, that it was sold here at a considerable loss, even at the increased rate of 12 seers per rupee, a rate which cannot be exceeded without a general rise of wages and rates, involving an expense far exceeding the loss from occasional temporary high prices.

It is satisfactory to be able to state that our recent purchases of rice on the coast have been made at much more favourable rates, and that the Officiating Superintendent speaks with confidence of being able to supply the article in future without loss to Government.

Rice is also now coming in from the Bustar country, where the crop has been good, and is procurable here at 14 to 16 seers per rupee.

5. With regard to the Transport Branch of this Department, the river, as now worked, is divided into four Reaches, which are numbered from the coast upwards.

The operations of the half-year under review were confined to the first two of these only, viz., the Reach below, and that above, the 1st Barrier.

Two steamers only were available for work in each reach, viz.:—

In the 1st Reach—	In the 2nd Reach—
"The Prince."	"The Arthur Cotton."
"The Shamrock."	"The Rose."

Of these, the first is by far the most powerful and effective. It draws, however, three feet of water, which prevents it working more than five months.

A comparison

* I have since learnt that the amount includes the commission paid to the retail contractor, which accounts for a large part of it.

A comparison of this vessel with one of the new steamers now being built in England, will show how inferior the best steamers we have hitherto had are to what will shortly be placed upon the river. The "Prince," with a length of 150 feet, beam of 25 feet, and draught of water of three feet, has only 150 horse-power effective.

The new steamers of the same beam but 20 feet shorter, will have 300 horse-power on a draught of only 12 inches.

With these vessels, therefore, we may anticipate far more favourable results than any that have hitherto been attained.

6. The work done during the half-year was of the usual kind, the transport of food, stores, and materials for the works at the First Barrier.

It amounted in the First Reach to 62,689 tons carried one mile, besides passengers and private stores.

The expenditure was 9,435 rupees, which gives a rate of 2-5 annas per ton per mile.

7. In the Second Reach, the work done was equivalent to 104,873 tons carried one miles, beside passengers and private goods at a cost of 4,183 rupees, or $7\frac{1}{2}$ pie per ton per mile.

8. The above figures do not, however, correctly represent the actual cost of carriage. To ascertain this, it is necessary to take into account the expenditure and work done not only during the half-year when the flotilla is fully occupied, but during the other half, when it is comparatively idle. For the current year this cannot be ascertained until the submission of the next half-yearly report. It appears, however, that the account for the previous year stands thus:—

	Tons, One Mile.	Expenditure.	Cost per Ton per Mile.
In the First Reach :		Rs.	Rs. a. p.
First half of 1865-66 - - - -	176,492	10,704	- - $11\frac{1}{2}$
Second half of 1865-66 - - - -	41,603	5,556	- - 3
Total for the Year 1865-66 - -	2,18,095	16,260	- 1 $2\frac{1}{2}$
In the Second Reach :			
First half of 1865-66 - - - -	92,937	7,064	- 1 $2\frac{1}{2}$
Second half of 1865-66 - - - -	- - - -	5,609	- - -
Total for the Year 1865-66 -	92,937	12,673	- 2 2

The higher cost in the Second Reach is owing to the steamers there having been almost exclusively employed in towing down limestone from the River Tal, which is only accessible during three months of the year with interruptions.

In the First Reach, the steamers were employed for a larger part of the year in bringing up supplies from the coast, and the distances between the termini were four times as great as in the Second Reach.

9. The expenditure above shown includes all working expenses and cost of establishments, both permanent and temporary, but does not include interest and depreciation in cost of flotilla or repairs.

I hope, before the next report is submitted, some arrangement will be made which will admit of the latter items of cost being brought into the account, so as to show the total actual cost of carriage.

10. The comparison of the working of the steamers and boats in the First Reach during the half-year under review, with that for the corresponding half-year of 1865-66, is unfavourable to the former. The cost of carriage in each stands thus—

	Cost per Ton per Mile.
	Rs. a. p.
First half of 1865-66 - - - -	- - $11\frac{1}{2}$
First half of 1866-67 - - - -	- 2 5

The increase in the last half-year can be satisfactorily accounted for. It is attributable to the small quantities carried, so small that the flotilla was not half occupied, though the expenses necessarily remained nearly the same as before. Thus in 1865-66, 176,492 tons, one mile, were carried at a cost of 10,704 rupees, while in 1866-67, only 62,689 tons, one mile, were carried at a cost of 4,935 rupees.

The partial suspension of the works was the cause of this. The officiating superintendent was not permitted to lay in and send up, as formerly, while the navigation was open, the supplies for the whole year, but only just so much as sufficed to meet the demands of the works from month to month. No other orders could be given in the uncertainty as to what amount of work would be undertaken at this barrier. The consequences have been, first, that we have until very lately been compelled to purchase in small

small quantities in dear markets, and secondly, that the stores which might have been brought up during the monsoon months in our steamers are now coming in boats at a greatly increased charge.

11. For the Second Reach, the comparison is in favour of the past half year, the cost having been $7\frac{1}{2}$ pice per ton per mile against one anna $2\frac{1}{2}$ pice in 1865-66.

The reason is, I believe, that there was a large quantity of cut stone to be carried this year in addition to the limestone, so that the boats and steamers were more fully employed.

12. The last head in the report is Land Transport. This is confined chiefly to the tram-road at First Barrier. The cost during the half year reported upon, amounted to 4.83 annas per ton per mile, being a trifle more than in the preceding half year.

There are several causes for the expensive nature of this carriage, though it must be remembered that it is much less than carried by bullock cart would come to.* The tram-road, according to the original design, was to have had a flat iron-bar on the top of the wooden rails, and was to have been worked with nett loads not exceeding one ton. Owing to the abandonment of the tramroad scheme, the road was never completed. One half only has been covered with iron-bar, and that half has been worked with nett loads of two to three tons. The consequence is that the unprotected wooden rail is worn out, and the protected rail bruised and broken down by the excessive loads which have been put upon it.

The distances also which goods are carried by it are short, viz. 5 to 18 miles, and the full means of transport have to be maintained at all times of the year, whether there is employment for them or not. The tramroad will, however, not be much longer required.

13. I may advert in conclusion to the important modifications which I have proposed in my No. 8 of second ultimo, to make in the Transport and Supply Division, the adoption of which will, I believe, if sanctioned, facilitate the operations and reduce expense.

(No. 813, dated 9th January 1867.)

From *J. H. Dennison, Esq.*, Officiating Superintendent, Transport and Supply Division, to Superintending Engineer, Upper Godavery Circle.

I HAVE the honour to submit the following report of operations in the Transport and Supply Division, Upper Godavery Works, for the half-year ending 31st October 1866-67.

2. As already stated in previous reports submitted, the Transport and Supply Division comprises—

(A.) Carriage of provisions, engineer stores and other departmental stores, as also passengers; this is styled the transport service, and is divided into river and land transport; the former being two branches, viz., First and Second Reaches.

(B.) Purchase, storage, and retail of provisions for the labourers on the works constitute the supply branch.

3. The following Table will show cost of the permanent establishment employed during the half year, and the proportions chargeable to the Transport and Supply Branches:—

	—	Transport.	Supply.
Permanent Establishment:	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
1 Acting superintendent from 1st to 24th May 1866 -	464	232	232
1 Acting superintendent for six months, at 450 rupees per month - - - - -	2,700	1,350	1,350
1 Assistant superintendent for May 1866 - - -	250	125	125
1 Commander, flotilla, First Reach, for six months, at 200 rupees per month - - - - -	1,200	1,200	—
1 Sub-engineer for six months, at 400 rupees per month - - - - -	2,400	2,400	—
1 Overseer for six months, at 180 rupees per month -	1,080	540	540
1 Sub-overseer for six months, at 60 rupees per month	360	180	180
Office establishment for six months - - - - -	2,205	1,103	1,102
	10,659	7,130	3,529

4. The

* We have never yet been able to hire bullock-carts for these works at a lower rate than eight annas per ton per mile.

This rate was paid in 1862 for carriage of 1,500 tons of limestone in the dry season, in consequence of the stoppage of the works during the navigation season.

TRANSPORT.

13. This branch of the division is divided into river transport and land transport, the former being again sub-divided into first and second reaches, as already stated.

RIVER TRANSPORT.

14. The flotilla employed consists of steamers and boats distributed as follows :—

1st Reach.—That between Dowlaisbarem and the first barrier ; distance 96 miles.

Steamer - - - Prince.	Steamer - - - Trevelyan, in ordinary.
„ - - - Shamrock.	„ - - - Queen „
Boats, two of - - - - -	- - - 70 tons each.
„ six of - - - - -	- - - 50 „
„ three of - - - - -	- - - 35 „

2nd Reach.—That between first barrier and second barrier ; distance 85 miles.

Steamer - - - - -	- - - Arthur Cotton.
„ - - - - -	- - - Rose.
„ - - - - -	- - - Hope, in ordinary.
Boats, two of - - - - -	- - - 50 tons each.
„ one of - - - - -	- - - 40 „
„ ten of - - - - -	- - - 30 „

3rd Reach.—That between second and third barriers ; no steamers or boats.

4th Reach.—That above third barrier.

Steamer - - - - -	- - - May Flower, in ordinary.
Boat, one of - - - - -	- - - 30 tons „

15. The fleet of steamers and boats enumerated, continue attached to the respective reaches where they have been working during the preceding half-year, and require no particular mention in this report, there being only a slight variation from what has been stated in previous reports respecting them.

16. Steamer “Fawn” used as a dispatch boat during the preceding half-year, has been transferred to the executive engineer, first barrier works ; and the “Shamrock” has been transferred from second to the first reach, and substituted by steamer “Rose.”

17. As regards the working of the steamers during the half-year, there is no important change to state as affecting their efficiency ; and no particular mention need be made in this report, except that they have all rendered the same service as heretofore, the “Prince” being the most efficient of the whole fleet, as stated in previous reports.

18. The freights carried and towed up during the half-year consisted of provisions’ materials, stores, and treasure for the first barrier works ; a small quantity of private and other departmental stores, passengers, and labourers for the works ; the freights down amounted to but very little.

19. The steamers carry but little on board ; all freights are towed up by them in boats or flats already described ; the quantity carried in the first reach during the half-year is as follows :—

	<i>Tons.</i>
Total engineer stores, one mile - - - - -	9,193½
„ divisional stores and supplies, one mile - - - - -	53,496
„ private and other departmental stores, one mile - - - - -	1,506
Total Tons carried one Mile - - - - -	64,195½
Passengers and workpeople carried up - - - - -	267 whole distance.
Workmen - - - - -	430 „

20. The total expenditure during the half-year in first reach is as follows :—

	<i>Rs.</i>
Permanent establishment - - - - -	4,777
Temporary „ - - - - -	224
Labour and materials - - - - -	6,070
TOTAL - - - - -	11,071

21. From this the income of this reach, 991 rupees, is to be deducted, which leaves actual expenditure 1,080 rupees for the carriage of stores, as follows:—

	<i>Tons.</i>
Total engineer stores, one mile - - - - -	9,193½
„ divisional stores and supplies, one mile - - -	53,496
„ private and other departmental stores, one mile -	1,506
TOTAL - - -	64,195½

Workmen - - - - - 430

22. Calculating at the rate of three pie per man per mile, the usual rate of third class passage, it comes to 645 rupees; if this sum is deducted from 10,080 rupees, there remains a balance of 9,435 rupees net expenditure on 62,689½ tons, giving a rate of two 5-12th annas per ton per mile; this, compared with the past half-year, shows as follows:—

	Total Tons Carried One Mile.	Total Expenditure.	Rate per Ton per Mile.
	<i>Tons.</i>	<i>Rs.</i>	<i>Rs.</i>
Half-year ending 31st October 1866 - - -	62,689½	9,435	2½ ⁵ / ₁₂
Ditto - ending 30th April 1866 - - -	41,608½	5,556	2½ ⁷ / ₈
TOTAL - - -	21,086	3,879	-¼

Difference, more carried.

SECOND REACH.

23. The steamers in this reach have been employed in towing boats laden with cut and lime-stone from the Boomalunka and Moongoor quarries. The quantities carried during the half-year in this reach were as follows:

	<i>Tons.</i>
Engineers' stores carried one mile - - - - -	103,452
Divisional stores „ „ - - - - -	1,421½
Total Tons carried one Mile - -	104,873½
Workpeople - - - - -	556 whole distance.

The total expenditure in this reach for the half-year is as follows:

	<i>Rs.</i>
Permanent establishment - - - - -	1,177
Temporary - ditto - - - - -	113
Labour and materials - - - - -	3,035
TOTAL - - - <i>Rs.</i>	4,325

From this, if the carriage of 556 workpeople at three pie per man per mile, *Rs.* 141. 11. 7., be deducted, it will leave balance *Rs.* 4,183. 4., expenditure on carriage of 104,873½ tons, giving a rate of 7.65 pie per ton per mile; this compared with the half-year ending 31st October 1865-66, as no work was done in this reach for the second half, we have as follows:—

	Total Tons Carried One Mile.	Total Expenditure.	Rate per Ton per Mile.
	<i>Tons.</i>	<i>Rs.</i>	
Half-year ending 31st October 1866-67 - - -	104,873½	4,183½	Pie - 7.65
Ditto - ending 31st October 1865-66 - - -	92,937	7,064	Annas - 1.21
Difference - - -	11,936½	28,880½	Pie 4.66

LAND TRANSPORT (TRAMWAY).

24. The permanent tramway commences at Gollagudiem, the general landing place for all steamers and boats, and ends at Dumagudiem, a distance of 19 miles.

25. Toorbacco, a village situated midway between the terminals, is the relay station where the trains meet, and exchange cattle and freights, as stated in previous reports, in which the whole particulars relative to the working of this branch of the transport service has been fully set forth.

26. The work performed on the tramway during the half-year consisted in the transport of provisions, departmental stores and materials, engineer stores, private stores, work-people and passengers. Quantities carried are as follows:—

	<i>Tons.</i>
Engineers' stores carried one mile - - - -	4,820½
Divisional stores and supplies, ditto - - - -	21,140½
Private and other stores - - - -	875
Total Tons carried one Mile - - -	26,836
Workpeople and Passengers carried one Mile - -	308

27. This expenditure on this carriage shows as follows:—

	<i>Rs.</i>
Permanent establishment - - - - -	1,176
Temporary - ditto - - - - -	592
Labour and materials - - - - -	6,349
TOTAL - - - <i>Rs.</i>	8,117

28. From this amount income on private and other stores and passengers realised amounting to 282 rupees; if deducted from above amount will leave 7,835 rupees as actual expenditure on carriage of 26,836 tons, one mile, or at the rate of 4·83 annas per ton per mile.

If we compare this with the operations of the past half-year, we have as follows:—

	Total Tons Carried	Total Expenditure.	Rate per Mile per Ton.
	<i>Tons.</i>	<i>Rs.</i>	<i>Annas.</i>
Half-year ending October 1866 - - -	26,836	7,835	4·83
Ditto - ending April 1866 - - -	23,895	7,135	4·75
Difference - - -	2,941	700	·08

In conclusion, I beg to state that, notwithstanding the operations during the half-year being very limited, still a fair rate of carriage has been shown, and would doubtless have been more favourable if the usual stock of provisions had been laid in, say for six or eight months, and carried up by our own *flotilla* and tramway during the season as heretofore; and the unprecedented high price of gram at present for feeding cattle on tramway helped to enhance the carriage on tramway; and the establishment also that had to be retained has also helped to raise the carriage in all the branches of the transport service. The steamers, notwithstanding the unfavourable season, were not called upon to do the work they might have done had more stores for the transport and supply division been purchased. Every exertion was put forward to work as economically as possible and keep down expenditure; and the rate of carriage in the first reach would have been more favourable, were it not for the cause already shown, as also to an unusual heavy expenditure in small gear being incurred on steamers and boats in the first and second reaches during the season.

Enclosure 2, in No. 19.

(No. 297 c.—Government of India.—Public Works Department.)

To the Chief Commissioner of the Central Provinces.

Sir,

Fort William, 8 April 1867.

Civil Works.
Communications.

I AM directed to acknowledge receipt of your Secretary's letter, No. 83—1179, dated 2nd March 1867, forwarding Progress Report of the Godavery Navigation Works for the half-year ending 31st October 1866.

2. I am to request that you will be so good as to explain briefly what the items are which comprise the "Miscellaneous Charges to Labour" entered in the Statement, and that an explanatory note may be given in future reports regarding this item, and any other of the same nature.

3. The report will be sent to the Secretary of State.

I have, &c.

(signed) *C. H. Dickens*, Colonel, R.A.,
Secretary to the Government of India.

— No. 20. —

(No. 107.—Public Works.—Government of India.—Public Works Department.)

To the Right Honourable the Secretary of State for India.

Sir,

Simla, 11 July 1867.

Civil Works.
Communications.

IN continuation of our Despatch, No. 36 of 1867, on the subject of the prosecution of the Godavery Navigation Works, we have the honour to forward, for the information of Her Majesty's Government, copies of the letters noted below from the Chief Commissioner of the Central Provinces, forwarding an interesting report by Major Haig on the subject of the navigation of the Kanhan and Wynegunga rivers, and increasing the supply of water for irrigation in the Godavery Delta.

2. We are not disposed at present to give any encouragement to projects for extensions of the Godavery Navigation Works till those already in progress are approaching completion, and have so informed the Chief Commissioner, but as it would be useful to ascertain the real facts of the case as regards the alleged insufficient supply of water for irrigation in the Delta, the Madras Government has been requested to furnish us with information on this point.

We have, &c.

(signed) *John Lawrence.*
W. R. Mansfield.
H. S. Maine.
G. N. Taylor.
W. N. Massey.
H. M. Durand.
G. U. Yule.

Enclosure 1, in No. 20.

(No. 151.—1868, dated 5th April 1867.)

From Major *C. Pollard*, R.E., Officiating Secretary to Chief Commissioner of Central Provinces, in the Public Works Department, to Secretary to Government of India, Public Works Department.

It will be in your recollection that together with this office Despatch, No. 267—3079, of the 19th October last, was submitted a copy of Mr. Temple's Minute on the River Wynegunga. In your letter No. 195 c of the 8th ultimo, it was stated, among other

other things, that the Wynegunga papers would be transmitted for the information of the Secretary of State.

2. In continuation of this correspondence, I am now directed to submit a report by Major Haig, the Superintending Engineer of the Godavery Works. On that officer's return from England in November last, he was requested by the Chief Commissioner to descend the river by boat, and to report the result of his observations. This he has done. The report is submitted in original, together with the map, because it contains several interesting bird's-eye sketches, evidently by Major Haig's own hand, to the vivid and life-like character of which Mr. Temple can testify, which cannot be detached from the rest, but which the Government of India may like to see. Hereafter, if it be desired, the report can be printed together with this letter.

3. In reference to the navigable capabilities of the Rivers Wynegunga and Kanhan, Major Haig remarks (paragraph 96)—

“It will be satisfactory to the Chief Commissioner to find that his estimate of these two rivers, as set forth in his Minute on the subject, is quite confirmed by the more detailed examination of them which I have now made.”

It is not, therefore, necessary to trouble the Government of India with lengthened remarks on the present occasion.

4. Mr. Temple held that the second or lower barrier of the Wynegunga extended from the confluence of that river with the Pranheeta, up to a point near Chamoorsee. Major Haig holds that it extends further on up to Gurchooroolee, there being two difficult places between Chamoorsee and Gurchooroolee. The Chief Commissioner would still suppose that these two difficulties might be overcome by blasting; and it is clear that the river bed between Chamoorsee and Gurchooroolee is not so continuously or thoroughly a barrier, as the river bed between the confluence and Chamoorsee. If, however, the overcoming of this, the first or great barrier, be seriously undertaken, the above point of difference would not be material.

5. For the overcoming of this barrier Mr. Temple suggested two anicuts at intervals, relying partly on Colonel Fife's authority. Major Haig prefers doing this by a canal which he has described. At the present stage it is not necessary to discuss this at length; but Major Haig's suggestion seems to be a very valuable one.

6. Mr. Temple's Minute contemplated the Wynegunga, if improved at all, being rendered suitable for monsoon navigation, which of course includes the use of steamers. Major Haig observes that such navigation would not last beyond three or four months, and that the steamers would remain unemployed for a portion of the year. All this is very true. But they would not, *per se*, constitute any objection to the project, for precisely the same conditions as exist on the Godavery itself, and are now not held to outweigh the advantages of the scheme; or if steamers shall be available all the year round for the improved Godavery, they would equally be so for the improved Wynegunga.

7. Major Haig urges that the attempt first be made to improve the Wynegunga bed for dry-weather navigation, relying on a reservoir to be formed at the Pench for the additional supply of water which would be required. He strongly urges the formation of the Pench reservoir.

8. Without at all abandoning any of the views expressed in his Minute, Mr. Temple yet thinks there is much force in what Major Haig advances. Looking to the distant prospect there must be of overcoming the first or lower barrier of the Wynegunga, while the third barrier of the Godavery has yet to be accomplished, the Chief Commissioner fully sees the desirability of improving meanwhile the dry-weather navigation of the Wynegunga. And Mr. Temple has so often urged the desirability of the Pench project in his Minutes marginally noted, that it is not necessary to add anything now to Major Haig's advocacy of the same thing.

9. In conclusion, the Chief Commissioner would reiterate his former recommendation to the effect that the whole subject of the Wynegunga be investigated simultaneously with that of the third barrier of the Godavery.

Minute, dated July 1864, on the Pench River Reservoir. Minute on Wynegunga River and its affluents.

Enclosure 2, in No. 20.

REPORT on the NAVIGATION of the KANHAN and WYNEGUNGA RIVERS.

(Dated 14th December 1866.)

From Major *F. T. Haig*, R.E., Superintending Engineer, Upper Godavery Circle, to Secretary to Chief Commissioner, Central Provinces, in the Public Works Department.

HAVING just arrived at this place (Doomagoodium), I have the honour to submit some rough notes on the navigation of the Kanhan and Wynegunga rivers, which route I took at the suggestion of the Chief Commissioner on my way down from Nagpoor in preference to that of the Wurda.

KANHAN.

2. The first obstacle to navigation in the Kanhan is met with at Lahiree (Reddie in map); and having been given to understand by Mr. Low, Deputy Commissioner, that no boat could get through the rocks at this spot, I dawked to Mohoda, and thence walked up to inspect the river at Lahiree. I found, however, that there would be no difficulty in descending from Jooler in a canoe, and accordingly had one sent up from Mohoda, and in it commenced my voyage down river on 14th November.

3. A rough plan of the river at Lahiree is shown in Drawing opposite, No. 1. The bed is a mass of rock, with numerous channels through it from a little above Sookree to some distance below Lahiree. The worst place is at (a) where the passage is very narrow, with a fall of perhaps five feet in a length of 100 yards. I estimated the total fall in this rocky reach, one mile and a half in length, at 13 feet.

Navigation is doubtless practicable in a moderate flood, but it appears to be questionable whether mere blasting would make the passage practicable in the dry weather navigation.

4. A few rocks are met with here and there down to Cheridie.

5. A mile below Cheridie the channel is much obstructed by large masses of rock for one-third mile. Fall in this distance probably four feet.

6. Opposite Matuee, just above Mohoda, the most formidable obstruction of the whole is met with. I give a sketch of the position of the rocks at this place. (See Drawing, No. 2.) Owing to the manner in which the channel winds through them, it must be almost impossible to pass this spot in the monsoon, save during very high floods; and in the dry weather, when the river is low, the rush of water is so great, and the passage so tortuous, that it requires the utmost dexterity to prevent even a canoe being dashed against the rocks. The rocks being high, this is even a more impracticable spot than the reach at Lahiree above mentioned.

7. On the whole, I am inclined to think that it may be found impracticable to render the five miles of river between Lahiree and Mohoda navigable in monsoon by clearing away rock in the bed.

I estimate the average fall at four or five feet per mile; and at two or three points it is very much greater than this. It may eventually be necessary to avoid this reach altogether by a canal. This, however, would not be an expensive work.

8. From a point about half a mile below Mohoda, the slope of the river suddenly changes; long deep pools, some of them miles in length, with short shallows between, and mostly quite clear of rock, succeed the rapids and rocky bars met with above Mohoda. From this point, in fact down to the junction with the Wynegunga, the Kanhan is an excellent navigation, and the fall cannot, I think, exceed one foot and a half per mile. A few rocks are met with, of no great consequence, at the points I shall now mention. I give a detailed description of them merely as a guide in future operations, that an officer employed in clearing the channel may know where the obstructions are to be found; not that, in the case of nine-tenths of those here specified, they are of the slightest importance, or in any way affect the question of the navigability of the river.

9. Half mile to three-quarters of a mile below Mohoda there are large masses of rock mid-river, but with a broad clear channel between them and the left bank.

10. Near Bhamoda (Bomboda in map) are a few small rocks of no importance.

11. About a mile below this the boatmen showed a point on the bank, 22 feet above present water-level, above which they say floods never rise.

12. Just above Chickna the floods have a tendency to cut out some very large masses which project from the right bank, but do no harm. River channel clear and good.

13. At Wandra (left bank) four or five rocks lie awkwardly in a good clear channel; a few pounds of powder would remove them, and make the navigation perfectly good.

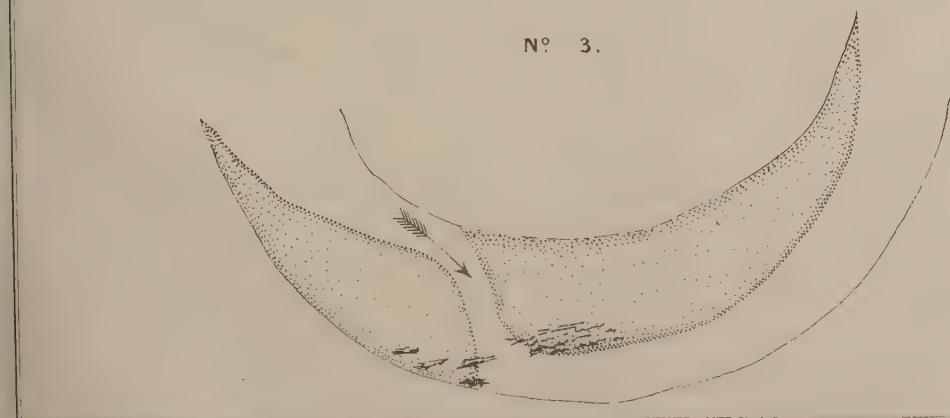
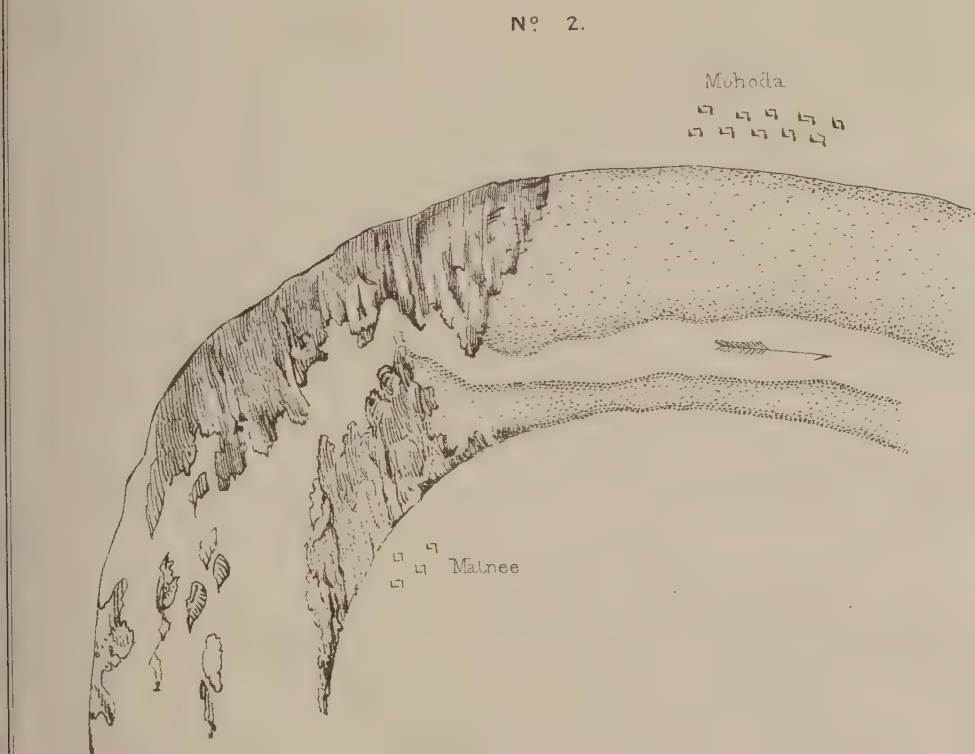
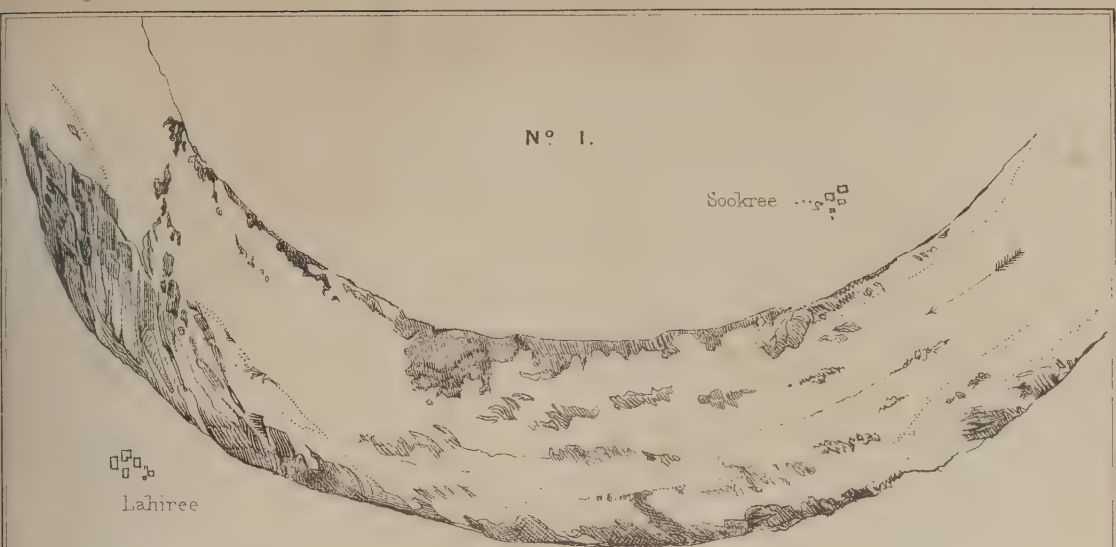
14. Half mile above Mohagaon a very few rocks lie off left bank, and should be removed. The cost trifling.

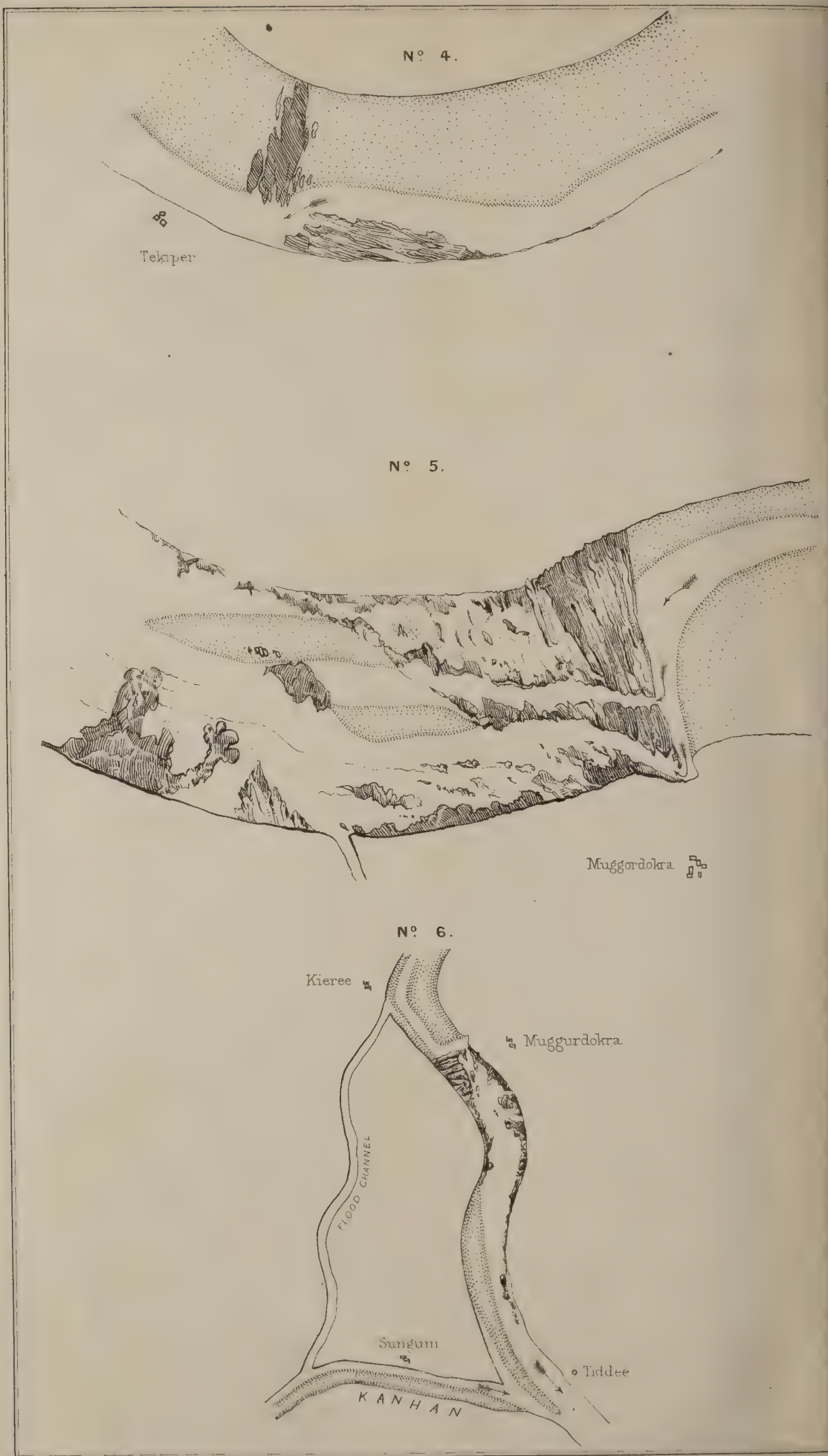
15. Near Wourna are one or two large low masses of soft crumbling rock, easily removable.

16. Half mile above Panmara, on left bank, the channel is much silted and obstructed by a number of low rocks scattered along a length of quarter mile. The rock, friable (schist) mostly, removable by crow-bar. A little below the village other masses run out from the bank which are more serious, as the stream hugs the bank and runs in among the rock. There is, however, a good channel outside of them in which a few detached rocks should be removed.

17. Three-quarters of a mile below Boregaon some low ridges of rock, which may be easily cleared away, cause much silting of the bed, with a fall of one foot in a short distance. (See Sketch, No. 3, opposite.)

18. Three-quarters





18. Three-quarters of a mile lower down, some ridges run out from right bank, sloping across stream in an opposite direction to those last mentioned. They cause silt, and injure the summer channel, but do not prevent navigation.

19. A mile above Lohâra some scattered rocks lie off left bank. They injure the channel and require removal.

20. Quarter of a mile further on, a few similar, but less in number, on the right bank.

21. A few small rocks lie off Ourmarra, right bank; eight or ten may require removal.

22. This completes my notes on the Kanhan. From Sookree downwards, this river is clearly divisible into two sections; the first, five miles in length, from Sookree to Mohoda, much obstructed by rock, and having a fall of probably four feet per mile; the second, 19 miles in length, from Mohoda to the mouth, having a very slight fall, probably not exceeding one and a half foot per mile, and a channel perfectly navigable in its present state, except during low stages of water, and then only obstructed at two or three points, where blasting of small amount would be absolutely necessary to clear the passage.

23. Judging from Mr. De Gronsillier's account of the river above Sookree, I should suppose that the 18 miles above that place, up to Kamptee, are about as favourable for navigation as the 19 miles below Mohoda.

They appear at any rate to be as little obstructed by rock.

WYNEGUNGA.

24. I now come to the Wynegunga, on which I launched my canoe at Bhundara on the 16th November.

The Wynegunga at Bhundara, and for three miles below that place, to near the hill at the Korumbée, is much broader, and evidently has a much greater fall than at any point for 50 miles lower down. The shoals were very bad. The fall, I should suppose, not less than three feet per mile. A very few isolated rocks to be seen.

25. From Korumbée to Kieree the navigation is good, with broad deep channel, except at one place a little above Tékipâr, where some large masses of rock running out from both banks must make a very bad monsoon passage. In the dry weather the channel is rather winding, but deep and unobstructed. (*See Sketch, No. 4, opposite.*)

26. A mile or two lower down lies the great mass of rock to which the Chief Commissioner has given the name of the Second Barrier of the Wynegunga. A Sketch given opposite (No. 5).

The river here (at Muggurdokra) would have been completely barred across by an immense mass of rock running out from the right bank, had it not cut for itself a narrow passage round the extreme point on the left shore. Round this point, and through one other channel near it, the stream finds its way in the dry season. The passage is quite practicable for boats at this time of the year, but in the monsoon must be most perilous. Mr. Temple has described these rocks in his Minute on the Wynegunga; and the accompanying illustration will, with the remark that the rocks rise from 10 to 15 or 20 feet above summer level, give a sufficiently clear idea of the nature of this very formidable obstacle.

The obstruction does not extend over above half mile in length of the river. Below that some large rocks project from the banks, but the passage mid-river is broad and deep. On the whole, however, I think that the rocks here may justly be styled a barrier, that is to say, that they constitute such an obstruction as no amount of blasting can effectually remove, and which it will be necessary to avoid in the monsoon by a lateral canal.

27. Mr. Temple has pointed out the curious flood-channel which may possibly be made use of for this purpose. This channel, which has probably been formed by the floods tearing open two drainage channels running into the Kanhan and Wynegunga, starts from a point half a mile above the barrier, and joins the Kanhan about two miles from its mouth at a very favourable point. Its bed is many feet above the summer level in either river, but as this level in the Wynegunga would probably be raised some 20 feet by a weir across the river at Muggurdokra, it is probable that this channel would require very little deepening to fit it for a canal to connect the pool above the weir with that below. (*See Sketch, No. 6, opposite.*)

28. A few large rocks lie awkwardly in the large pool opposite Tiddee.

29. From Tiddee to Ambora the channel is good; at one or two places a very few detached rocks.

30. At Ambora there are the remains of what seems to have once been a barrier of rock running right across river from a hill on either side. Portions of this barrier, which is merely a narrow ridge of rock about 20 yards wide, still remain, but with wide and deep channels between them. Mr. De Gronsillier's description of these, "only narrow shoots for boats to go through," is most incorrect. A man-of-war might pass through one or two of them without injury. Two at least are 50 to 80 yards in width, and very deep. There

was no current through them when I passed, and the blasting away of one rock, at the expense of 100 or 200 pounds of powder, would make a passage 100 yards wide, if required. The rocks here are, in point of fact, of not the slightest importance. (See Sketch, No. 7, opposite.)

31. Half mile below Ambora are a few rocks mid-river of no consequence.

32. One mile below Ambora, near Chota Ambora, the river is again crossed by a narrow ridge of rock similar to that at Ambora, but lower. For 200 yards in width the rock seldom appears above water, and there are many channels through it. A very trifling amount of blasting would suffice to clear the passage.

33. Similarly, at Chota Ambora, and for a short distance below, some low scattered rocks obstruct the passage, and should be removed.

They are very similar to those about Kivâka below first barrier of the Godavery. The cost would be trifling; the passage is quite free enough as it is, but the rocks cause shoals and prevent that concentration of the stream in one channel which is necessary to good navigation.

34. A few similar occur at intervals along right bank to a point half a mile above Weirrath, where they end in a long groin of low rock running out 100 or 150 yards. This, however, in no way affects the navigation.

35. Just above Kochee five or six rocks are dotted about the bed. They may be removed with a few pounds of powder. The navigation from Ambora down to this point is excellent.

36. Half mile below Sowergaon, where the channel passes from the right to the left bank, three or four lumps of rocks occur mid-river, and have a bad effect, deflecting the stream again towards the right bank, and so preventing its even flow. They may be removed at the cost of a few pounds of powder.

37. A little further down masses of rock project from the left bank, and tend also to deflect the stream and to cause shoals.

38. Half a mile above Balapoor a large rock mid-stream causes a shoal and divides the stream.

39. From quarter mile above Balapoor down to Sonder, the channel is more or less^s obstructed by rocks. Above Balapoor the obstruction is of a serious nature, the masses of rock being very large.

There is a fine straight passage mid-river between the rocks 60 yards wide, which is quite sufficient for the dry weather navigation, and which could easily be widened to 100 yards.

40. At Balapoor the channel passes over to the left bank, which it follows through large masses of rock. The passage is tortuous, but quite practicable down to Sonder. Thence it improves, becoming much wider, the rocks still occurring at intervals on each side.

41. Some heaving blasting will probably be required to make a good dry-weather channel above Sonder, and heavier still for the monsoon passage.

Below Sonder, comparatively little will be required for the dry weather, and much less than above that village for the monsoon passage.

42. A careful and detailed survey of this part of the river will be required, from above Balapoor down to Kappree. There is a considerable fall in this distance, perhaps three feet, in the rocks above Sonder.

Below Sonder, however, the channel is broad and deep.

43. Opposite Malchee some low rocks, level with the water, obstruct the channel and cause a shoal. Just below the village a single rock, which five pounds of powder would entirely remove, stands one-third of the way out from the bank. It is dangerous for the monsoon navigation.

44. Off Ghosee, large masses extend out from the left bank, but leave fully a third of the width of river perfectly clear. The removal of the rock at Malchee, and of one more here, would give a clear channel 100 to 200 yards wide.

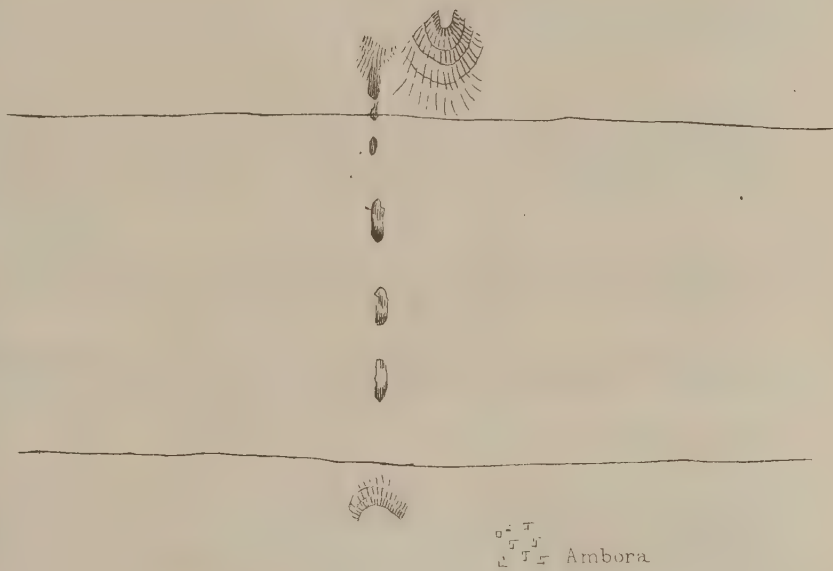
45. Off Jimnapoor (Joonapoor in map), some very awkward masses lie about the channel which is on the right bank.

A good deal of clearing will be required, but a perfectly good channel may be made at small cost. The channel should probably be cleared along the bank.

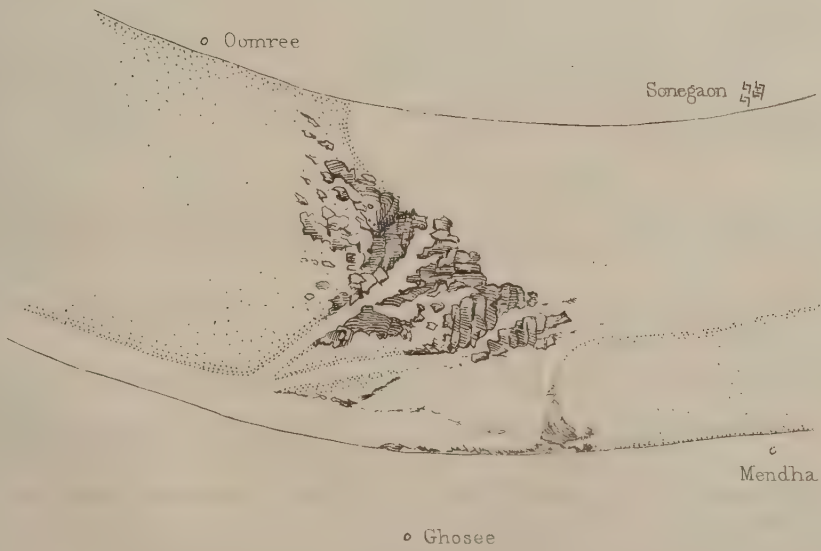
46. Thence a fine pool extends down to Sonegaon; five or six small rocks should be removed opposite the village.

47. At Ghosee there is a serious obstruction. A mass of rock, with three or four channels through it, slants from the left bank across to the right. It is highest on left bank, and gradually sinks to the level of the bed as it approaches the right. There is probably a perfectly uninterrupted passage along the right bank during monsoon. The deep channel, however, is on the left bank, and must be cleared there through the rock, probably on the right side of the little island shown in the Sketch, No. 8, opposite. The rocks rise about eight feet above summer level on left bank. There are three or four passages through,
with

N° 7.



N° 8.



with a fall of perhaps three feet in the dry season, but in the monsoon there is probably abundant vent for the stream, and no great rush through the channels on left bank by the time the river has risen six feet. Blasting only will be required here. A good survey required at this place.

48. Half mile below Oomree a low mass of rock, 60 or 70 yards long, lies out in the stream, which it divides, causing a shoal. It is of no consequence to the monsoon navigation.

49. In the reach above Korumbee, where the channel is on the right bank, there are a few scattered rocks level with the water.

A fine navigation all the way down to Pohonee. A few small rocks above the village.

50. From Pohonee to Pohona (left bank) is mostly a succession of deep pools, quite clear of rock, but above Pohona one or two bad shoals occur. The channel is very broad, flat, and shallow.

51. Three-quarter mile below Etan low rocks, seldom appearing above water, lie out 100 to 150 yards from left bank. The passage is tortuous, but there is plenty of water. Some clearing will be required.

52. Below Etan the river begins to widen, the left bank cutting away, until at Diggoree, and thence, down to where the river turns sharp to the south, the width is very great. The channel, however, which follows the right bank is good. A few rounded lumps of rock lie awkwardly in it where it crosses at Kyrena, from left to right bank, and should be removed. In the long pool above Morena there are also a few low rocks of small size which must be cleared away.

53. One of the most necessary improvements to this part of the river will be the protection of the right bank by means of groins. The stream now plunges right on to the bank below Kyrena, and is rapidly cutting it away.

54. Below Balasur a large island is shown in the map. The western channel is now, however, quite silted up, and can only be practicable when there is a good flood in the river. There is thus but one channel in the dry season.

55. We may pause here to note that, from this point downwards, a change evidently takes place in the inclination of the river bed.

From Bhundara down to this point, a distance of 50 miles, the slope cannot, I think, exceed two feet per mile, and very probably is not more than one and a half feet. I judge of course only by the eye, but from the great lengths of the still-water pools, and short length of the streams which connect them, and which have generally a very moderate slope, I do not think the inclination of the bed can exceed the amount stated. The navigation is, on the whole, excellent. Only at one or two points will any extensive clearing of rock be required (I except, of course, the Muggurdokra Barrier), and the rocks met with at various points, as registered above, are for the most part of trifling importance. In fact, I had no expectation of finding such a good navigation as now exists throughout the whole of this 50 miles of river. It compares favourably with some of the best parts of the Godavery below, and the slope of the bed cannot be much greater than in that river.

Below Oomree, however, which is near the head of the island above-mentioned, where the river, after running some miles in an easterly direction, suddenly bends due south, the fall evidently increases, and I should suppose may be as much as two and a half feet per mile, down to where the lowest barrier commences, some 60 miles above the mouth. The navigation in this lower half of the river is consequently not so good as in the upper; shoals are more frequent; but still it is good, and, with some clearing of rock, will answer all purposes of communication.

I shall now continue the register of the rocks requiring removal.

56. In the reach below Lariji are four or five masses of low-lying stones which have the worst effect, causing the water to spread over a large surface, and making the channel very shallow.

57. Just above Eershee there are a few scattered rocks under water which divide the stream.

58. Where the channel crosses the river below Eershee, it is obstructed by some large masses of rock.

A good deal of clearing will be required. A good survey will be necessary here. The rock is mostly in small lumps, easily removable without blasting.

59. From Lariji downwards, the river becomes narrower, more so than anywhere above. The banks are of a firm yellow clay. This piece of the river, however, contains broad flats where the bed is perfectly level, and the dry-weather channel of great width, the stream of an even depth and very shallow. Altogether this is the most difficult piece with regard to ultimate improvement, as far as shoals are concerned, of any yet met with, unless it be the three miles immediately below Bhundara.

60. Half mile below Runmuchurn (opposite Mhenda), there is a dangerous rock mid-stream.

61. Half mile below Kurrakurra, some rocks run out from right bank into the pool, and may be dangerous in the still water. They should be buoyed or marked.

62. A long pool ends one-fourth mile above Pepergaon, and the stream then crosses in a narrowed channel over pebbles, and amongst rocks, to the other side. The rocks are the outlying lumps of large masses which extend from left bank opposite Pepergaon, where they rise 12 feet above water. Those in the channel are low, flat masses, awkwardly placed, some of them below water. The passage is good for boats, not for steamers. A good deal of blasting will be required and a careful survey.

63. On to Nildza, the left bank is fringed with rock. One lump, very awkwardly situated, lies mid-river a mile above Nildza.

All this part of the river is a deep still pool, some miles in length, extending past Nildza and Pájgaon to a mile below the latter village.

64. Quarter mile below Nildza, a few large rocks are dotted about the bed. They are badly placed for the monsoon navigation, but offer no obstruction in dry weather. Both banks are lined with rocks.

65. All this part of the river is narrow, not above 400 to 450 yards in width.

66. Below Pájgaon the river widens greatly, the stream following the right bank until, near Ogara, it is crossed and quite blocked up by some very low rocks and bushes.

The rock is seldom to be seen, but the bushes which grow in it catch the sand and form a bar. My canoe was dragged through with difficulty. Some clearing will be required.

67. Ogara to Sagaon, the channel is wide and clear except at one place where there is a little rock.

68. Opposite Sagaon a large mass lies mid-stream, which might be troublesome in the monsoon, but is not so now, there being plenty of room on both sides of it.

69. From Sagaon to Doroollee the channel crosses to the right bank. At the corner some awkwardly placed low rocks should be removed. Opposite Doroollee a large mass of rock mid-stream should be buoyed for the monsoon navigation.

70. Opposite Shivinee (Seonee) large masses are scattered about the bed. There is plenty of room and deep water in the dry weather, but some clearing will be necessary to make a good monsoon passage; a good passage may be made down right bank.

71. At Shivinee, and for half mile below, the rocks are more frequent, but mostly low, and covered with bushes. This continues to a point three-fourth mile below the village, where the river is nearly barred by low lumps of rock not visible above water, in which grow bushes which collect sand and mud. The few openings through these are closed by the demurs, or fishermen, with low dams of stone and stakes. The stakes being cut from the bushes growing close by, soon strike, and thus fresh barriers of bushes are made, and fresh deposits of sand collected. In this way the river is fairly dammed across, and the only passages are through the openings left for the bag-nets. There is, however, nothing worthy the name of barrier in the peculiar signification which attaches to the term on the Godavery. There is nothing that may not be cleared by digging and some blasting. A considerable part of the obstruction here, and at many other similar places, is due to the operations of successive generations of fishermen, whose traps and dams are to be met with at every mile almost of the whole river.

72. A good and careful survey is required of all the above part of the river from Ogara downwards.

73. From Dewilgaon and Awurgaon the channel clears, and so continues with a good fall down to the point where it turns sharp to the west, where the road shown in the map, from Hurda to Wasser, crosses. Here large rocks commence; one very large mass lies mid-river, and rises 15 feet above water.

Probably this part of the river would be impassable in its present state during the monsoon.

Some heavy blasting would be required to clear a channel which would probably lie along the right bank. The water is deep, and much of the blasted rock might be thrown in where it falls. (See Sketch, No. 9, opposite.)

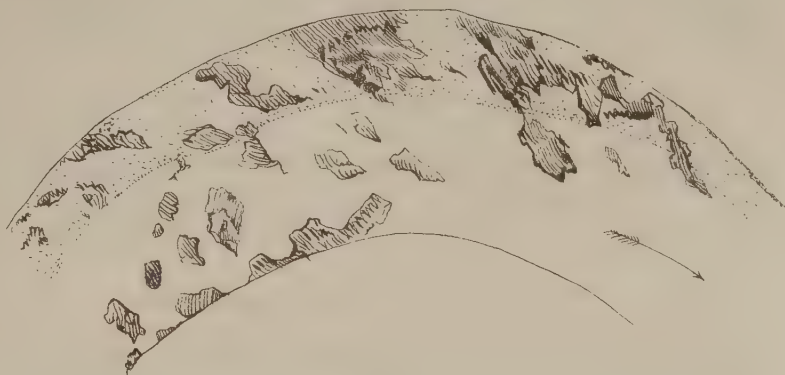
The obstruction extends over only a very short distance, not above 300 yards. The removal of one or two large masses, containing perhaps $30 \times 20 \times 3 = 1,800$ cubic yards of rock, would suffice to form a channel.

The beautiful dark red rock seen in the 3rd barrier of the Godavery is met with here also. The first seen in descending the river was at Shivinee.

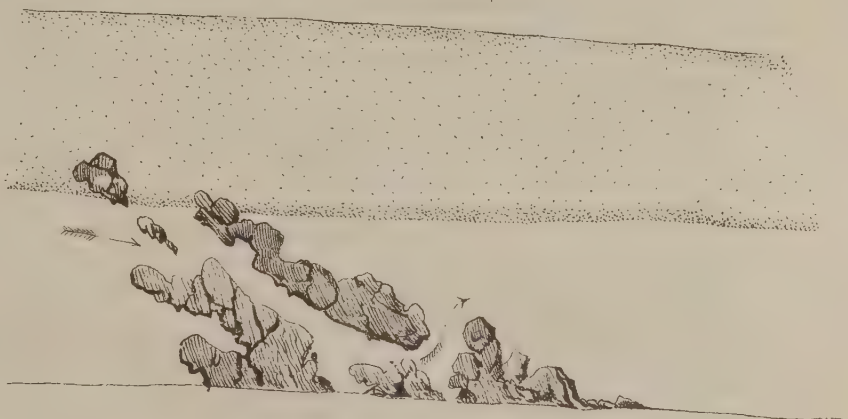
74. Opposite Korasowlie, the channel is obstructed by two large masses of high rock, one of which should be removed.

75. One

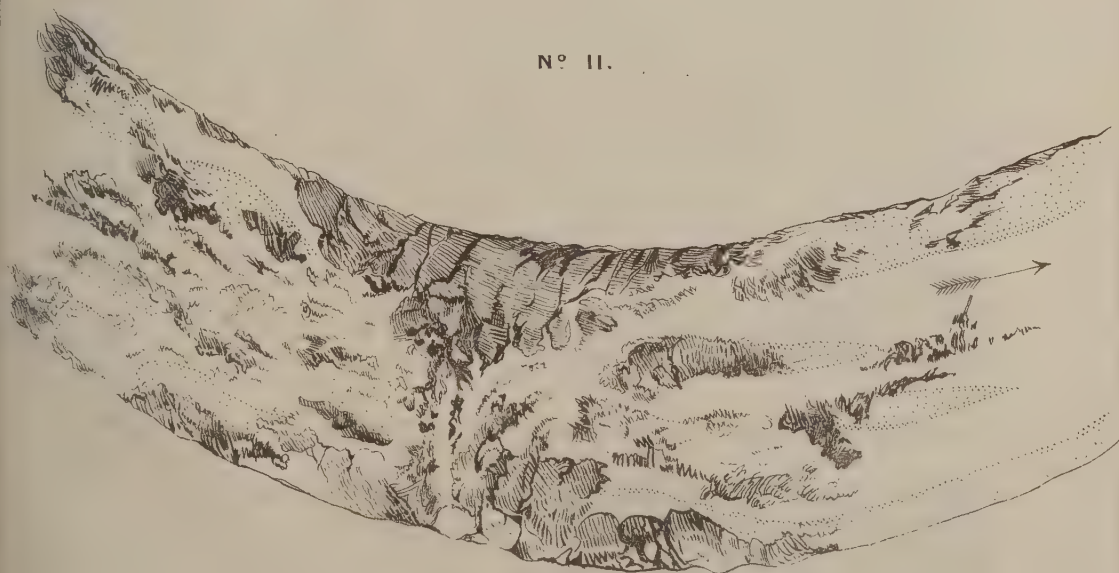
Nº 9.



Nº 10.



Nº 11.



75. One mile below the same village another two similar masses. The passage is good in dry weather, but the channel generally shallow and broad.

76. At Kooroolee the channel is again blocked by a few rocks under water with a thick growth of bushes. At such places as this the existence of rock can only be inferred from the fact of the bushes growing as they do in the bed. So far as my observation extends, such bushes are an unfailing indication of rock beneath, as it is only when they can twine their roots round the rocks that they are able to withstand the force of floods, which otherwise invariably tear them from their bed.

77. From Kooroolee to Deoree the channel keeps to the right bank. It is clear, except at a few points where there are a few insignificant rocks or bushes.

78. At the confluence of the Nuddee, next above the Kathan Nuddee, rocks are a good deal scattered about the channel.

Thence all is clear to the Kathan Nuddee, left bank.

GHURCHOOROLEE BARRIER.

79. About half mile below the Kathan Nuddee rocky islands begin to be scattered thickly all over the river bed, the water flowing among them in several channels, but not with any great velocity. Opposite Ghurchooroolee the rock closes in from both banks, and fairly bars the river across, the stream descending at this point by two rapids, in the upper of which it falls (as I judged by the eye) six feet in 100 yards, and in the lower three feet in the same distance, there being a pool of about the same length between. (See Sketch, No. 10.) In point of fact, the bed from where the rocks are first met with down to a little below Ghurchooroolee, a distance of two and a half miles, is a mass of rock, the tops of which only show themselves in the form of islands in the upper two miles, but which rises at last to a height of 10 to 20 feet above water near the banks near Ghurchooroolee, and dams the river across. I fear the obstruction at this place must be regarded as a barrier; the first of series which are met with from this point down to the mouth, and which will probably render it necessary to abandon this part of the river, and to connect that above with the Wurda and Pranhita by a canal.

We have here, at any rate, two miles of rock bed ending in an abrupt descent of nine feet (if my estimate is correct) in 300 yards. The two miles above have a fall probably not less than three feet per mile. The total fall would thus be 15 feet in two and a half miles or less, which would give an average of six feet per mile, supposing a channel to be cut through the bed with an uniform slope. Such slope would be too great for navigation, so that even if there were no other inducement arising from the existence of similar obstructions further down river, this alone would probably render a lateral canal necessary. It must be remembered, however, that all my measurements are made by the eye, and an instrumental examination of the spot will be necessary to determine the actual conditions of the case. I entertain, however, little doubt that from this point downwards the river will be found to be practically unnavigable.

80. The Ghurchooroolee barrier passed, the channel is pretty clear of rock down to Dabgaon. Half mile below the village the channel is much obstructed by large masses of high rock, through which there is a fall of one and a half or two feet. The masses are so large, and run out from the bank in such an awkward manner, that it is difficult to say what should be done. (See Sketch, No. 11.)

81. The whole river from this point onwards to where it turns to the south, four miles, is obstructed every half mile by large masses of rock crossing the channel which winds through them. Much expensive blasting would be required to clear a proper channel.

82. At the corner where the river turns south the rocks thicken. For a mile the bed is all rock, with a passage 50 or 60 yards wide through it, about 150 yards from the right bank. The fall all down this reach is considerable. The reach from the corner down to Sonapoor is also much obstructed. The channel lies along the left bank, from which large masses run out mid-river in a way fatal to any permanent improvement of the dry-weather channel, and rendering monsoon navigation most perilous, if at all practicable.

83. From Sonapoor to Neelajnee the channel is pretty clear; in fact, down to Donara only occasional rocks are to be found.

84. Just below Donara the river is again barred across by low rocks and bushes, through which there is a fall of four or five feet in one-fourth mile. The rocks then recede towards the banks, leaving an open basin with rock bottom for half mile. Then comes another short bar of rock, followed by another opening with rocky sides. The rock then closes in upon the channel again, leaving only a narrow passage, opening out gradually into a pool fringed with large rocks running out from both banks. This sort of pool continues, the water spreading over a wide surface, with rocks and islets through it, down to Kurroolee, where again occurs a bar of rocks and bushes, with one or two passages closed in the usual manner by the fishermen. The river continues thus onwards to

Kooroor; the bed a mass of rock covered with water in which it shows itself in numerous projecting rocks and bushy islets scattered all over the bed.

85. The rocky reach above described, from Donara to Kooroor, three miles in length, may, I think, properly be regarded as a barrier not improvable by means of clearing and blasting in the bed itself.

Whatever doubt may exist as to the propriety of the designation in this case, there can be no question of its applicability to the next obstacle met with.

HARUMBA BARRIER.

86. At the Chota Nuddee, just above Kooroor, the rocks thicken and soon close right across river opposite Harumba (Arumba), forming a bar down which the river falls in a rapid 350 yards in length, a height of 10 feet, as I suppose. The rocks rise to a considerable height on the left of the main passage, and also in some places on the right. This is a true barrier, and is in point of fact the lower end of the mass of rock of which the bed is composed from Donara downwards, a distance of four and a half miles.

87. From below this barrier, on past Markunda, to where the Kowtee rocks commence, the channel is wide and tolerably clear.

88. Kowtee is the point designated by the Chief Commissioner in his Minute as the head of the "First Barrier of the Wynegunga." I need not describe the river below this point. It is a succession of rocky barriers and rapids down to the confluence of the Wurda.

The worst rapids are at Bhoreghât and the Larolee Island. In the last of these, the descent of the rapid cannot, I should think, be less than 30 feet in one and a half mile. The stream runs here in numerous channels through a wilderness of trees and bushes rising out of the rock, the scene being one of the wildest imaginable. I was benighted in my canoe at the entrance of it, and for two hours had to thread my way in the dark through a maze of channels, the water rushing with great velocity through a tangled growth of grass and bushes.

INCLINATION of the BEDS of the WYNEGUNGA and KANHAN, and their Navigable Capabilities.

89. The foregoing detailed description of the river, tedious as it is, will be found of practical use whenever the work of improvement may be undertaken. It will, as already remarked, serve as a guide in selecting the places where clearing of rock is most required. I must now state the general conclusions at which I have arrived from this examination of the river as to the probable distribution of its fall and its capability of navigation. I shall refer only to the Wynegunga below Bundara, and to the Kanhan as far up as Kamptee.

These two rivers I have now navigated, and though in estimating their slope I can judge only by the eye, still it must be remembered that I have now been for years thoroughly familiarised with the appearance of the Godavery for 300 miles where it has slopes from one to two and a half feet per mile, and it is not probable therefore that, within some such limits, I can be far wrong in guessing the probable inclination of the Wynegunga.

90. First, with regard to the Kanhan:—From Sookree to the mouth, there cannot be the slightest question of the distribution of the fall in this river. The bed is composed of two inclined planes; the first, five miles in length with a considerable fall, which I estimate at four feet per mile; the second, 19 miles in length, with a very slight fall, which I think cannot exceed one and a half feet per mile. And as the navigation above Sookree is described by Mr. De Gronsilliers as good and unobstructed, the slope of the 18 miles from that village to Kamptee is probably not above two and a half feet per mile. The Sketch opposite (No. 12), then, would be a profile of the bed of the Kanhan.

91. Second, the Wynegunga:—The general distribution of the fall in this river also is very palpable to the eye.

Anyone after passing through the succession of long deep pools connected by short shallow runs, which extend from the junction of the Kanhan for 47 miles down to the point at Howree, where the river bends sharply to the south, can tell after he has passed that point that the river thence downwards to Ghurchoorolee, 40 miles in length, has a greater fall, for the pools are not so long and the shallows with sharp currents more frequent. And, similarly, no one can pass from Ghurchoorolee to Kowtee, and then from Kowtee to the mouth, without noticing that, while both these reaches have a greater inclination than either of those above, the lower has much the greatest fall of the two.

Now I should estimate the fall of the 47 miles from the Kanhan to Howree at one and three-quarter feet per mile, and that of the next 40 miles at two and a half feet. The levelling instrument must decide how far I am correct. Assuming, however, these to be the true slopes, let us see how we can account for the total fall between Kamptee and the mouth of the Wynegunga.

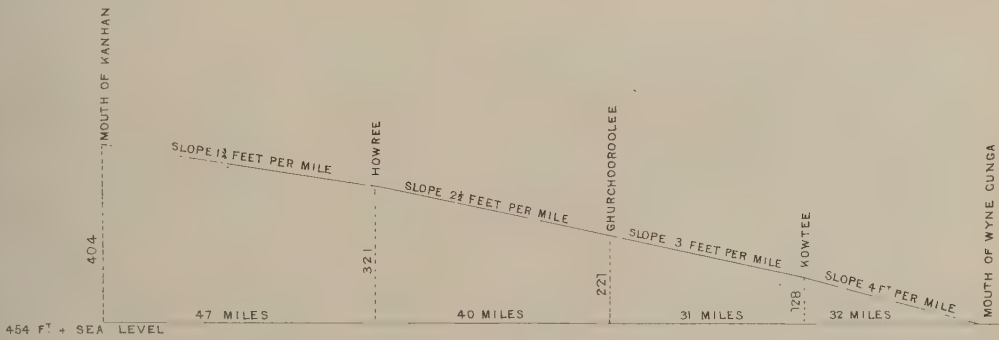
92. The level of the bed of the Kanhan at Kamptee above the sea has not, that I am aware of, been satisfactorily settled. I take it at 950 feet.

Nº 0.9. RETURN - EAST INDIA (GODAVERY RIVER.)

Nº 12.



Nº 13.



The height of the bed of the Pranrita above the sea we are certain of, two distinct series of levels closely agreeing having determined it. It is 350 feet. The rise in the third barrier up to the mouth of the Wynegunga has also been found to be at the rate of four feet per mile, or 104 feet in 26 miles, making the height of the bed at the confluence of the two rivers 454 feet above sea-level.

We have, therefore, a total fall to account for from Kamptee to the confluence with the Pranrita of $950 - 454 = 496$ feet.

Of this we have as above shown—

1. In the Kanhan—

18 miles, at $2\frac{1}{2}$ feet	-	-	-	-	-	-	Feet.
5 „ at 4 „	-	-	-	-	-	-	45
19 „ at $1\frac{1}{2}$ „	-	-	-	-	-	-	20
							27

2. In the Wynegunga—

47 miles, at $1\frac{1}{2}$ feet	-	-	-	-	-	-	83
40 „ at $2\frac{1}{2}$ „	-	-	-	-	-	-	100
Total fall down to Ghurchoorolee	-	-	-	-	-	-	275

leaving $496 - 275 = 221$ feet to be accounted for in the 63 miles between Ghurchoorolee and the mouth, which would give that piece of the river an inclination of three and a half feet per mile. This would probably be distributed thus :—

Ghurchoorolee to Kowtee, 31 miles, at 3 feet per mile	-	-	-	-	-	Feet.
Kowtee to the mouth, 32 miles, at 4 feet	-	-	-	-	-	93
						128
TOTAL	-	-	-	-	-	221

I should have been inclined to estimate the fall in both these last reaches above this, but if the level I have assumed for the bed of the Kanhan be correct, the fall may not be more. Even if the level referred to is 1,000 feet + sea, instead of 950 feet, the extra 50 feet would be easily accounted for in this last rocky reach of the river. This confirms my estimate of the slight fall in the two long reaches above Ghurchoorolee.

93. Colonel Fife, in his memorandum on the Wynegunga, assumes that the total fall in the last 76 miles of the river may be only 60 feet. He appears to have inferred this from some measurements, or rather guesses, of the falls at particular points, given in Mr. De Gronsilliers' Report. This, however, is totally erroneous. To suppose that the fall in the most rocky part of the whole river, where rapids sometimes extend for miles, is less than one foot per mile, is palpably wrong. Colonel Fife would never have entertained the idea for a moment if he had seen this part of the river. The fall certainly cannot be less than what I have stated.

94. I feel, therefore, very confident that the slopes of the Wynegunga approximate closely to those above given, which may be represented by the Sketch opposite (No. 13).

95. This much, then, seems now very certain, that out of the 192 miles of river, from Kamptee to the mouth of the Wynegunga, or, in other words, to the third barrier of the Godavery, 123 are, both in regard to the gentle declivity of the bed and their freedom from any serious obstructions, such as will afford good navigation; leaving 69 miles, of which five are in the Kanhan, which will require special works to complete the communication. Of course, longitudinal sections of the bed must be taken with the usual instruments before everybody will be satisfied about this, and a certain amount of drawing paper must be covered with profiles and diagrams.

This appears to be inevitable. But the fact of the navigability of the Wynegunga and Kanhan, and their value for navigation as compared with the Godavery, is as certain as if we knew the profile and plan of every square yard of their beds.

96. It will be satisfactory to the Chief Commissioner to find that his estimate of the navigable capabilities of these two rivers, as set forth in his minute on the subject, is quite confirmed by the more detailed examination of them which has now been made, excepting only that it now appears that the lower 60 miles must be regarded as unnavigable in their natural condition, instead of the last 30 only, as he was led to conclude from the information then available. It will also appear in the sequel that, owing to the great bend in which the extra 30 miles are situated, the extra cost of the works which this reach will render necessary, will be in a very much lower ratio to that of the works for the lower 30 miles than that of the respective lengths of the two reaches.

97. Before proceeding further, I would guard against two possible misapprehensions which may arise from the perusal of the above account of these rivers. (1.) That the estimate of the slopes of their beds, which leads to such highly favourable conclusions as to their navigable capabilities, is based upon very loose data, and therefore unworthy of

reliance; and (2), that the long register of rocks above given shows that these rivers must in reality be much more obstructed than is here represented.

98. With regard to the slope of the bed, it is to be considered that we know for certain within 50 feet or so the total fall between Kamptee and the mouth of the Wynegunga. This cannot be more than $1,000 - 454 = 546$ feet, which, on a total length, as shown by the map, of 192 miles, gives an average fall of 2·8 feet per mile. It is more probably $\frac{192}{2} = 2·5$ feet. If Colonel Fife quotes correctly from Mr. Hanna's report on the Kanhan reservoir, it is only 2·2 feet. That this slope is not uniform is palpable to the most inexperienced eye, as any one can tell the difference between a series of rapids and 50 miles of still drip water pools. Hence it does not require much skill to distribute approximately the total fall between these parts of the river, which manifestly have a more gentle slope, and those which plainly have a considerable fall, and this is all that I have attempted to do. It is quite certain, then, that the distribution of the slopes cannot differ widely from that above given.

99. With regard to the extent of rock clearing required all along the river, it will be observed that out of the 53 places where rock is met with in the 130 miles between Kamptee and Ghurchoorolee, by far the greater part have the remark added that the rocks are of little importance, or that a very trifling amount of blasting will be required for their removal.

There are not above three or four of these where any considerable extent of clearing would be required for the monsoon navigation, and, as a rule, I believe that even less blasting will be necessary for the dry weather navigation. The insignificance of the greater part of these obstructions can only be appreciated by actual inspection. I have, however, made a note of them all, with a view to their ultimate removal whenever that may be necessary in connection with the reservoir system of improvement.

100. We have, then, in the Wynegunga and Kanhan rivers, whose inclination varies between one and a half and two and a half, or possibly three feet per mile. The slopes of the Godavery and Pranhita vary from one to two feet, and in one place below the first barrier, for 10 miles the slope is as much as two and a half feet. In regard, then, to this fundamental point, the slope of the bed, we may conclude that the Wynegunga and Kanhan will afford as good navigation as the rivers below.

101. I need not enlarge upon the value of this line of navigation, which would connect the great stations of Kamptee and Nagpoor with the sea. The Chief Commissioner has already described the resources, trade, and population of the great valley drained by the Wynegunga and its affluents. There appears to be reason to conclude that, in addition to the line of navigation terminating at Kamptee, 85 miles more of the Wynegunga extending to the foot of the Sautpoora range, may be navigated, together with 40 miles of its most important tributaries. What I have now to do is to state what works will probably be necessary for opening this navigation.

SKETCH OF WORKS REQUIRED FOR OPENING THE NAVIGATION.

102. Confining our attention in the first instance to the Kanhan from Kamptee to its mouth, and to the Wynegunga from thence to the confluence of the Wurdah, it is to be noted that if my estimate of the fall is correct, there is one reach in each river which it will be necessary to avoid by canal. That in the Kanhan extends from Sookree to Mohoda, a length of five miles, and that in the Wynegunga, from Ghurchoorolee to the mouth, a distance of 63 miles by river, but of very much less by canal.

103. With regard to the first of these, accurate levels alone can determine whether it will be necessary, as I suppose, to abandon the river channel. It is possible that it may not be so, but in any case, even if a lateral canal should be found indispensable, the cost will not be great, the length being only four miles, and the width of river where the anicut would be placed some 400 or 500 yards.

A sufficient quantity of stone would probably be found in the bed on the spot to build a solid masonry dam similar to that at the first barrier of the Godavery.

The works, then, at this point, will not be of an expensive character.

104. The barrier on the Wynegunga is of a more formidable character, and will require more expensive works.

I entertain no doubt that the levels will show that Ghurchoorolee must be regarded as virtually the head of this barrier. In the 31 miles between that point and Kowtee, there are at least two rocky reaches which appear to be incapable of improvement by means of mere blasting and clearing in the bed. Of the impracticable nature of the next 32 miles from Kowtee to the mouth, there has never been any question. I take it, therefore, that we have to choose between two methods of dealing with the lower 63 miles of the river either by a series of anicuts or dams with locks in the river bed, similar to that at the second barrier of the Godavery, or by a lateral canal. And whichever plan we may adopt, it is essential that it should include the connection of the Wynegunga navigation with that of the Wurdah and Godavery by means of the third barrier (Godavery) canal, or whichever work may be adopted for carrying the navigation past that barrier.

105. Now,

105. Now, as to the first of these methods, a series of anicuts, Colonel Fife has proposed to throw an anicut across the Pranhita, just below the junction of the Wynegunga and Wurdah, at a point where the bed is 28 feet below the level of the rock on the crest of the 3rd barrier at Daroor, seven miles higher up; and he calculates that the water thus dammed up would submerge some miles (it does not appear how many) of the rocky bed of the Wynegunga, and seven miles of that of the Wurdah, the water standing back on a level with that on the crest of the 3rd barrier.

Without at all questioning Colonel Fife's ability to plan and construct such a work, I must say that an anicut blocking up 28 feet out of 40 of perpendicular height of flood-section, in a river with a fall of four feet a mile, is a work which I should think twice about before I ventured to propose it. But assuming the practicability of such a work, it is easy to show that the money it would cost would yield immensely superior results if expended in a different plan. What would the effect of that anicut be? It would submerge and render navigable the upper seven miles of the 3rd barrier and $\frac{28}{4} =$ seven miles of the Wynegunga barrier. It would in no way benefit the Wurdah above the 3rd barrier, and its beneficial effect would be limited to seven miles only of the Wynegunga. It would shorten the 3rd barrier canal by five or six miles, which, however, is a comparatively unimportant consideration. To effect all this would require an anicut 28 feet in height and three quarter mile long.

106. Now, suppose that, instead of this, we go seven miles further up the 3rd barrier and place our anicut on its crest, and thence lead a canal off from the left bank in the direction of the Wynegunga, in the same way as it has been proposed to lead one from the right bank down to the foot of the 3rd barrier, we gain at once the following important advantages:—

1st.—The anicut would be only 500 yards long instead of 1,350.

2nd.—Its height would be only 18 feet instead of 28.

3rd.—It would retain the water at a level of $28 + 18 = 46$ feet above the bed at the mouth of the Wurdah, instead of only 28 feet.

4th.—It would dam the water back 36 miles up the Wurdah, making the whole of that length of river a still-water pool, and submerging the worst shoals in that river; whereas Colonel Fife's anicut would leave the Wurdah in its natural condition without affecting its level, or benefiting it in any degree.

107. As to the effect of this anicut on the Wynegunga, we must now suppose the canal carried up (in point of fact it would be carried down from the head of the barrier) to the head of the Wynegunga barrier, and compare it in connection with its anicut at top of 3rd barrier, with Colonel Fife's series of anicuts up the Wynegunga. As an anicut of, say, 20 feet in height, would be required across the Wynegunga at the head of the canal, we should then have, even supposing the barrier to extend no further up river than Kowtee, 30 miles—

1 anicut 20 feet high, and $\frac{1}{2}$ mile long.

1 „ 18 „ and $\frac{1}{4}$ „ and 30 miles of canal.

Against—

1 anicut 28 feet high, and $\frac{3}{4}$ mile,

And $3\frac{1}{2}$ anicuts 28 „ and $\frac{1}{2}$ „ long.

I leave out the lockage, as that would be the same in vertical height in both cases, though the locks in the river-bed at each anicut would, with their accompanying sluices, be far more expensive than in the canal.

There would thus be 30 miles of canal against $3\frac{1}{2}$ anicuts 28 feet high, and half mile long. If the canal costs 40,000 rupees a mile, the total would be 12 lakhs. Would two of the $3\frac{1}{2}$ anicuts be built for that sum? I should think it very doubtful. So that, independently of any other objections which might be cited, I think it will probably be found that the series of anicuts would be a much more expensive plan than the canal. And if, as I have little doubt, not 30 but 60 miles of river must be treated in one or other way, the advantages of the canal method are greatly increased, to say nothing of the irrigation which it would afford to a considerable tract of country quite prepared to benefit by it.

108. If, as I suppose, the river must be abandoned below Ghurchoorolee, the connection of the navigation with the rivers below would, I should think, be best effected by leading off a canal from the right bank at that town, and carrying it down to the Wurdah above the originally proposed 3rd barrier anicut. The levels are evidently favourable for such a canal.

From Ghurchoorolee to Kowtee by river is 31 miles, with a fall of not less than 93 feet. Hence the ground on the bank at Kowtee must be this much lower than at Ghurchoorolee, or 58 feet lower than the water-level then, assuming the height of the bank to be 35 feet.

The direct distance across country between the two places being but 15 miles, there is plainly a rapid fall in the ground from north to south. Supposing now an anicut 20 feet in height built opposite Ghurchoorolee, and a canal cut thence direct from Kowtee, the water would, if carried on a dead level, be level with the surface of the country at a distance of only $2\frac{1}{2}$ miles from the head, if the fall in the country was uniform; but as there is a low water-shed further south, this distance would be increased by a few miles. Thus

it is evident that there would only be a very short distance of heavy cutting, and that very soon the water-level in the canal would so command the whole country, that there would be ample choice of route. The map shows a river coming down from the north to the west of Rajghur, and falling into the Wynegunga at Ghatkool. I have examined this river west of Rajghur, where it has a fine square well-shaped channel 50 yards wide, and think it may not improbably be made possible to use it for navigation, reducing its fall where required by dams with locks.

If so, the canal would probably be led into it in some such direction as that shown in the accompanying sketch map, and the navigation, after following the course of the river down to Ghatkool, would then be taken by canal down to the Wurdah. It is possible that a more direct cut might be made to this river from the anicut, as shown by the dotted line.

There would be altogether $221 + 20 - 48 = 193$ feet of lockage between Ghurchooroollee and the Wurdah, or 33 feet more than that in the proposed 3rd barrier canal.

109. It seems probable that, in this manner, the navigable part of the Wynegunga above Ghurchooroollee may be connected with the Wurdah and Godavery below. The length of artificial canal required, would not exceed 32 miles by the longest route, or 27 by the shorter. The longest of these is just the length of the proposed 3rd barrier canal.

110. Objections may possibly be found, after thorough examination of the ground, to the use of the river, which I shall call the Mhool river for the present, as it flows past that town, which is, I believe, the head-quarters of the district for navigation. In the Delta all the main lines of navigation are formed by thus improving natural drainages, the advantage being that a large channel is thus obtained for little or no cutting. But it may be found impossible so to control the floods of a river draining so large an extent of country as that referred to, as to render it a safe and secure navigation. It will probably be necessary, wherever practicable, to tank some of the water of this river and its tributaries, the whole of which may of course be used for navigation. A site which would probably be suitable for such a purpose, on the Andaree Nuddee, a branch which falls in a few miles above Pamoorina, was some years ago pointed out to me by Sir A. Cotton, as a likely one for the formation of a small reservoir for the summer navigation of the Godavery.

A reservoir formed here, as I have shown in the accompanying map, and replenished by an additional supply which might probably be led into it by a cut from the Eraie Nuddee (on which Chanda is situated), would both help to restrain the floods of the Mhool river below the confluence of the Andaree, and afford a store of water which might be led down to Chanda, and after supplying the wants of that town and some irrigation in the neighbourhood, afford also the water to a navigable canal which might then connect Chanda with the Wurdah.

It might be sufficient to dam the Eraie Nuddee at its mouth, and to turn a sufficient quantity of water into it, furnishing it with a boat-lock to connect it with the Wurdah, as shown in the map. Or it might be thought better to extend the aqueduct which would thus supply Chanda in the form of a boat-canal down to the upper end of the still-water pool formed by the third barrier anicut. This arrangement is shown in the map.

In this way, the important town of Chanda would be supplied with an abundance of good water, and placed in direct connection with the port of Coconada, boats loading and unloading at its quays.

111. Some irrigation would be afforded in connection with this project. The water led off from the Wynegunga at Ghurchooroollee would command the whole of the country between the Wurdah and Wynegunga, as well as a large extent on the east bank of the Wynegunga (supposing an irrigation canal cut on that bank), south of a line drawn east and west through Mhool. I have sketched on the map a few lines showing the direction which the irrigating channels would probably follow. I have no means of estimating the extent of land that would thus benefit, or the probable increase of revenue. There are some important towns on both sides of the Wynegunga, and everywhere the people are ready to make use of the water. Rice is grown all over the country now; some fine large fields of sugar-cane are to be seen wherever there is tank water available. I was struck with the rich, well-cultivated appearance of the valley of the Mhool river.

112. The extension of the navigation up the Mhool river, by means of a few dams with boat-locks, as far as Gurboree, would probably be an adjunct, though an insignificant one, of the above project.

113. Such, then, would be a rough outline of the project which, judging from present information, and my own inspection of the river, I should think the most promising for turning what, following the nomenclature adopted by the Chief Commissioner, may be termed the first barrier of the Wynegunga.

It includes, in connection with the works at the third barrier of the Godavery, the improvement of some 40 miles of the Wurdah, and the extension of the navigation to the town of Chanda. As this brings us up the Wurdah about half-way to Hingenghât, I may add a few remarks upon the extension of the navigation in that direction.

114. It is quite true that the valley of the Wynegunga is, in respect of extent, population, and resources, of much higher importance than that of the Wurdah, but I do not think that on that account there should be any hesitation about the extension of the navigation up the Wurdah to the highest practicable point, so as to give that valley the full benefit of the

the communication with the coast. Were there any comparison between the cost of the works required for this purpose above Chanda, and that of those for the opening of the Wynegunga, it might be a question whether one scheme ought not to be postponed until the completion of the other. But the Wurdah, as far as the mouth of the Wunna Nuddee, which comes down from Hingenghât, is so singularly and exceptionally well-adapted by nature for navigation, that there is reason to believe that the works required for its improvement will be comparatively inexpensive. The Wunna also has a fall of only two feet per mile from its mouth to Hingenghât; and even if it should be found impracticable to store water in the hills where it takes its rise, sufficient for the navigation of the Wurdah, there can be no doubt that the trifling quantity required for lockage, supposing the Wunna to be converted into a series of pools by means of dams, could easily be provided. It will, of course, be a question in what manner the navigation of the upper part of the Wurdah should be perfected; but among the alternative plans, that of a small reservoir situated somewhere on its head waters should certainly not be overlooked. When the question is taken up, I think a site might be looked for in three different parts of its valley, in the southern slopes of the hills, north of Hingenghât; on the northern face of the same range, and on the northern slopes of the hills which bound the Berar Valley on the south. The Beemra, a small tributary of the Wurdah, rises in those hills and joins the Wurdah some 10 miles south of Natchingam.

The practicability of storing water in the hills which shed the water of their northern slopes into the Beemra, and of extending the navigation for boats up the Wurdah and Beemra into Berar, should certainly be investigated. Such a scheme may be found to be not only practicable, but to combine with navigation a considerable amount of remunerative irrigation also.

115. To return to the Wynegunga. It will be observed that my remarks have been confined to that part of it below the junction of the Kanhan only, but the Wynegunga project in its completeness, as sketched out by the Chief Commissioner in his Minute, includes the navigation of 80 miles more of the river up to the foot of the Sautpooras, and some 40 miles of its tributaries.

It will be desirable that the river above Bhundara should be carefully examined in some such way as has now been done for it below that point. There is reason to believe that the obstructions, if there are any, will be found to be of no more importance than those in the open parts of the river below.

The Muggurdokra barrier is the only place where works of an expensive kind may be found to be necessary.

Such works certainly would be necessary for the monsoon navigation, but it is questionable whether they would be so for that of the dry weather. When I descended the river, the passage through the barrier itself was made without the slightest difficulty; the channel was quite wide enough, and being very deep there was little or no current.

The approach, however, where the stream crosses from the right to the left bank, running along the face of the great mass of rock of which the barrier consists, was awkward at one place where a single rock only of small size require to be removed. For navigation, from 15th October to May, I very much doubt whether anything more than a little blasting would be necessary. In the monsoon, when the river is full, the case is different; this barrier must then be one of the most dangerous parts of the whole river.

116. With regard, then, to the works that will be necessary, either in the river bed, or for conducting the navigation past those parts of it where the barriers lie, the following will probably be required if both monsoon and dry-weather navigation are contemplated:—

1. An anicut with lateral canal and locks at the first or lowest barrier of the Wynegunga.

2. An anicut with similar canal and locks at second or Muggurdokra barrier; the canal in this case not being above five miles in length at the utmost, possibly not more than two miles.

3. Another anicut with locks, or possibly with a short lateral canal, at the Mohoda barrier of the Kanhan.

4. Rock clearing at various points along both rivers, and doubtless also in the other navigable affluents.

117. But now, supposing these works to have been constructed, what shall we have gained? We shall have nearly 300 miles of river navigable; for what length of time?

This is a question to which I am perhaps not in a position as yet to give a positive reply but I have little doubt that the answer should be three and a-half months. On the Kanhan and on the upper part of the Wynegunga, there may possibly be occasional interruptions even during that time. Upon this point the Chief Commissioner is probably already in possession of better information than I am. Judging, however, from what I saw of the river in November, I think I cannot be far wrong in assuming that the navigation, without any addition to the stream from artificial sources, will be limited to a period of three months in the Kanhan, and perhaps three and a half in the Wynegunga. To what purposes, then, would the river be applied, supposing it to be available to this extent for navigation?

The local traffic which already exists would doubtless be largely increased. Boats would be used instead of the canoes now in use. I doubt, however, whether there would be any important increase of such traffic without the aid of steam. Steam-power is essential to the monsoon navigation of the Godavery, at least for the first three months of it; and it will doubtless be found so for the Wynegunga, which has a greater fall and current. Much more will it be necessary for the export and import trade with the coast; for the monsoon navigation, then, of the Wynegunga and its tributaries, steam-power must be employed.

118. It would not be necessary, I think, for this purpose, that any locks but those at the Muggurdokra barrier and the Mohoda barrier in the Wynegunga should be made large enough for steamers. Those in the canal at the lower or Ghurchooroollee barrier, might probably be made for boats only.

With so large an extent of river as 300 miles to ply in, steamers might be stationed on the Wynegunga, and work in conjunction with other steamers below the third barrier of the Godavery, without difficulty or any important increase of the cost of transport. Supposing, then, the works enumerated in 116th para. to be constructed, the locks in the canal at the lower barrier being boat locks only, and those at the other two barriers large enough for steamers, export and import, as well as local traffic, would be practicable for three to three and half months.

119. It appears to me, however, questionable whether, though perfectly practicable, such a traffic would be commercially profitable; or, if it were so, whether the high rates which it would be necessary to charge would not operate to confine the traffic within very narrow limits, and so greatly to diminish the value of the communication to the country. If the steamers are to be unemployed for eight or nine months of the year, the charges to cover interest in the capital invested in them must be a large addition to the cost of transport. Without expressing a decided opinion upon this point, which, in the present state of our information, would perhaps not be possible, there seems to be at any rate no question that the dry-weather navigation of the Wynegunga and its affluents must be of incomparably superior importance, supposing it to be practicable, to that of the monsoon months, and this has led me to consider whether it might not be advisable to confine our attention in the first instance to the means of rendering the river navigable during the dry season rather than to those for opening it during the rains.

120. Before entering upon this question, I would observe that the doubt above expressed, as to the Valley of the Wynegunga as a communication during the monsoon, is in no way inconsistent with that advocacy which I have always maintained of the importance of the rivers below for navigation at that time of the year. The two cases are very different. Starting from Chanda, supposing the third barrier canal completed, we have first of all about 40 miles of river navigable at all times of the year; and after passing the third barrier, we find the united waters of the Wynegunga and Wurdah flowing in a channel no wider than that of the former river, and with only half the fall, one foot per mile. These exceedingly favourable conditions continue down to the confluence of the Pranbitha with the main Godavery, where the volume of the stream is at once doubled by the contribution of that river, and only 30 miles lower down the Indrabutty falls in, making an important addition to the stream.

This line of navigation is, therefore, practicable for boats and steamers for several months of the year. The Wynegunga, which contributes only a part of the total discharge of the rivers below, has a much greater fall. Its period of navigation is, therefore, proportionately limited.

121. With regard, then, to the dry-weather navigation of the Wynegunga and its tributaries, I would offer the following points for consideration, simply as a contribution towards the thorough discussion of the whole question.

As I descended the river, I was several times struck with the fact that, contrary to what is the case on the rivers below, many of the places where the heaviest rock-clearing will be necessary would require far less work to open a practicable passage for the dry-weather navigation than to clear one for the monsoons.

There will of course be times during the rains when the floods rise so high as to submerge all, or almost all, the rocks; and at such times the navigation would be unobstructed, but such occasions are rare, and are confined in all probability to a few days only of the flood season.

I refer now to the average condition of the river at that season, and I observed that at nearly all the most obstructed places (the lowest barrier of course excepted), it would require more blasting to render the passage safe during floods than in the dry weather. The reason is that, at such places, large masses of rock are so thickly strewn about the bed, that to make a passage sufficiently direct for a steamer or a boat to follow, when there is a strong current in the river, would require the removal of much more rock than would be necessary merely to improve a somewhat winding channel, such as is to be found in all of them, and which neither steamer nor boat would have any difficulty in navigating when the current is slack. I believe that the detailed surveys which will be required at such points will show this to be the case. Reference is made to it in some of the notes in the commencement of this report.

122. In the next place, I would refer to what I have already remarked about the second or Muggurdokra barrier.

It appeared to me that very little would be required to make this part of the river, so utterly impassable as it must be in the flood season, perfectly passable for eight or nine months of the year. I found two deep passages through it with an almost imperceptible current in November, and thought that, with a very little improvement, these would answer all purposes for the greater part of the year.

123. It is questionable whether the same would be the case at the Mohoda barrier in the Kanham, but it certainly would be so as regards the rocks at Mohoda itself, and for four miles above it. Those immediately below Sookree, at the upper end of this rocky reach, are more formidable, *but could certainly be sufficiently cleared at small expense for the descending navigation.* For the ascent some special provision would have to be made (which, as the length would not be above 200 yards or so, could, I think, be contrived) to assist steamers, certainly boats, in the ascent.

124. Now, I think, with the fact before us of the very limited duration of the flood navigation, and the probability that, were that in the first instance to be abandoned, and our object were to render the river navigable for the other part of the year, a large sum which would be necessary to render navigation practicable for the shorter period would not be required to open the river for the longer period, it becomes a matter for careful investigation whether the very same, or nearly the same, outlay that would be required for a three months' navigation might not, if otherwise expended, give us a six months' navigation, or more. I mean that it is a question for consideration whether the money that would be required for anicuts, canals, and locks at the Muggurdokra and Mohoda barriers, as well as for the blasting of rock required only for the monsoon navigation, might not, with much greater advantage, be expended in storing the water which would give us a longer navigation at another time of the year.

125. One important consideration bearing upon this question is this, that a three months' navigation, say from February to April inclusive, supposing the available depth of water to be such as would afford really cheap carriage, would be of much higher value than three months of the monsoon navigation from July to September, for two reasons: *first*, that the current being much less than in the flood season, there would be much less hindrance to the ascent of the river by steamer, and boat traffic without the aid of steam would be perfectly practicable; *second*, that at this time of the year the crops would be just ready for export, instead of having to wait six months for carriage during the monsoon.

This one consideration it appears to me would be decisive, supposing we have our choice of the two ways of dealing with the river. Must it not be allowed that the superiority of the dry-weather navigation to that of an equal period of the monsoon would justify the outlay of a larger sum to obtain it?

126. But what if it should be found that the same outlay would give much more than three months' navigation in the dry season? That is to say, if the cost of the works at the Muggurdokra and Mohoda barriers, and the blasting of rock in other places, which works might be dispensed with, would provide water enough for five or six months?

At Muggurdokra the river is about half a mile wide. The lockage would probably be about 25 feet, and it might be found possible to manage with not more than a mile of canal, though this mile would be heavy cutting.

The width of the Godavery at its second barrier at the site of the anicut is 1,000 yards, and the lockage 41 feet. There will be no canal, but the rise of the floods is 70 feet above summer level, against probably only 40 in the Kanhan.

The estimate for the second barrier Godavery works is 11½ lakhs, which the Committee consider insufficient. Probably the cost of those at Muggurdokra would not be less than this.

Those at the Mohoda barrier, where dimensions and difficulties are all in a scale of about one-half those at Muggurdokra, might cost six lakhs.

Blasting for monsoon navigation might amount to two lakhs.

Altogether, the cost of the works above specified which would be required for the monsoon, but may probably be dispensed with for the dry-season, navigation, might amount to 20 lakhs, or, including establishments, 24 lakhs.

127. Colonel Fife's estimate for the Pench reservoir to contain 1,457,700,000 cubic yards of water is 16 lakhs, inclusive of establishments. This reservoir would supply a stream of 675,000 cubic yards per hour for three months, or of 506,000 cubic yards per hour for four months, or of 405,000 cubic yards per hour for five months.

Now, if any one of these volumes should be found sufficient for navigation, there can, I think, be no doubt of the superiority of this mode of treating the river to the other. I think it probable that 500,000 cubic yards per hour would be sufficient with the help of a little stone-work for contracting the channel at a few points where the stream spreads over too large a surface, but of course the question must be more fully investigated.

128. If, then, it shall be found that the works above specified as specially required for the monsoon navigation may be dispensed with if the dry-weather navigation only is contemplated, I think the mode of dealing with the river by applying the money thus saved to the formation of a reservoir should be first investigated.

129. But another question deserving of inquiry is this, whether the natural supply of water in the Godavery is not already insufficient for the requirements of the irrigated lands of the delta. It was quite certain from the first that the time must come, sooner or later,

according to the rate of increase of the area of irrigated land in the delta, when the Godavery must be replenished from artificial sources to supply the water required for the hot-weather cultivation. So far back as 1856 I pointed out in my first Report on the river, that the natural discharge of the Godavery is altogether inadequate to the demands of the delta. The anicut at Dowlaishwarum commands at least 1,000,000 acres, and the rate allowed for the monsoon irrigation, when the rain of course supplies in part the water required, has always been a cubic yard per acre per hour.

Thus the minimum required for the first crop would be 1,000,000 cubic yards per hour. For the second, or hot-weather crop, a larger quantity is, I believe, necessary. As the discharge of the river is not above 1,000,000 cubic yards at Dowlaishwarum on the 1st January, and gradually decreases from that time to 200,000 cubic yards in the beginning of June, it is inevitable that either an extra supply must be thrown in from reservoirs, or the second crop must be sacrificed, with a corresponding loss of revenue over the greater portion of the delta. In a district whose revenue, chiefly derived from the irrigated land, already amounts to 49 lakhs per annum, though only a part of the land commanded by the anicut has yet been watered, it is evident that the loss of the second crop must involve a very considerable sacrifice of revenue, and I have repeatedly urged the subject upon the attention of Government. Sooner or later we shall have to deal with it, and I believe the time has come when it should be made the subject of careful inquiry. I know that, years ago, the hot-weather supply was sometimes insufficient, and I have been informed that there have more than once been remissions of revenue in consequence. The following notification is, however, the first public recognition of the fact that I have yet seen, though it is very possible that there may have been such during the two years I have been absent from the country. It is extracted from a recent number of the "Godavery District Gazette," and is dated 26th November 1866:—

"1st.—Notice is hereby given that, owing to the scarcity of water in the River Godavery, there will be none available for dalwa or second crop cultivation in the current year in No. 1 Range, comprising the Ramachandrapur taluk, Cocanada and Coringa divisions.

"2nd.—All channels in that range will be closed, except the Cocanada and Samalcotta main canals, which will be open alternately for navigation only.

"3rd.—The tassildar and sub-magistrates concerned are, therefore, directed to give due publicity to this notice throughout their respective talooks or divisions, discouraging cultivators from making any attempts to grow dalwa, or any other second crop which require water from anicut channels.

"J. Fraser,
"Collector.

"Cocanada, 26 November 1866."

From measurements already made, I believe the supply of water in the Godavery this year to be about an average one, and I am informed by the executive engineer here that it is much more than there was last year. In all probability, therefore, the deficiency then led to similar results.

130. Now, here we have a distinct intimation that the cultivation under the anicut has already extended so far that there is a large deficiency in the water supply, so large that in three important talooks, comprising, I should suppose, about one-fourth or one-fifth of the whole irrigated area, the growth of the second crop must be prohibited. What loss of revenue does that represent?

131. I doubt, however, whether even this shows the whole state of the case. It is deserving of inquiry whether even in those portions of the delta not thus deprived of the second crop, the available water in the hot months is not applied, in part at least, to the growth of crops requiring less water than others which, were there a sufficient supply, would be more remunerative.

132. At any rate, I submit that there are now grounds for a full inquiry into the question of the water supply in the delta, and the Madras Government, so directly interested in it, will, no doubt, be ready to afford full information. Such an inquiry might probably come under the following heads:—

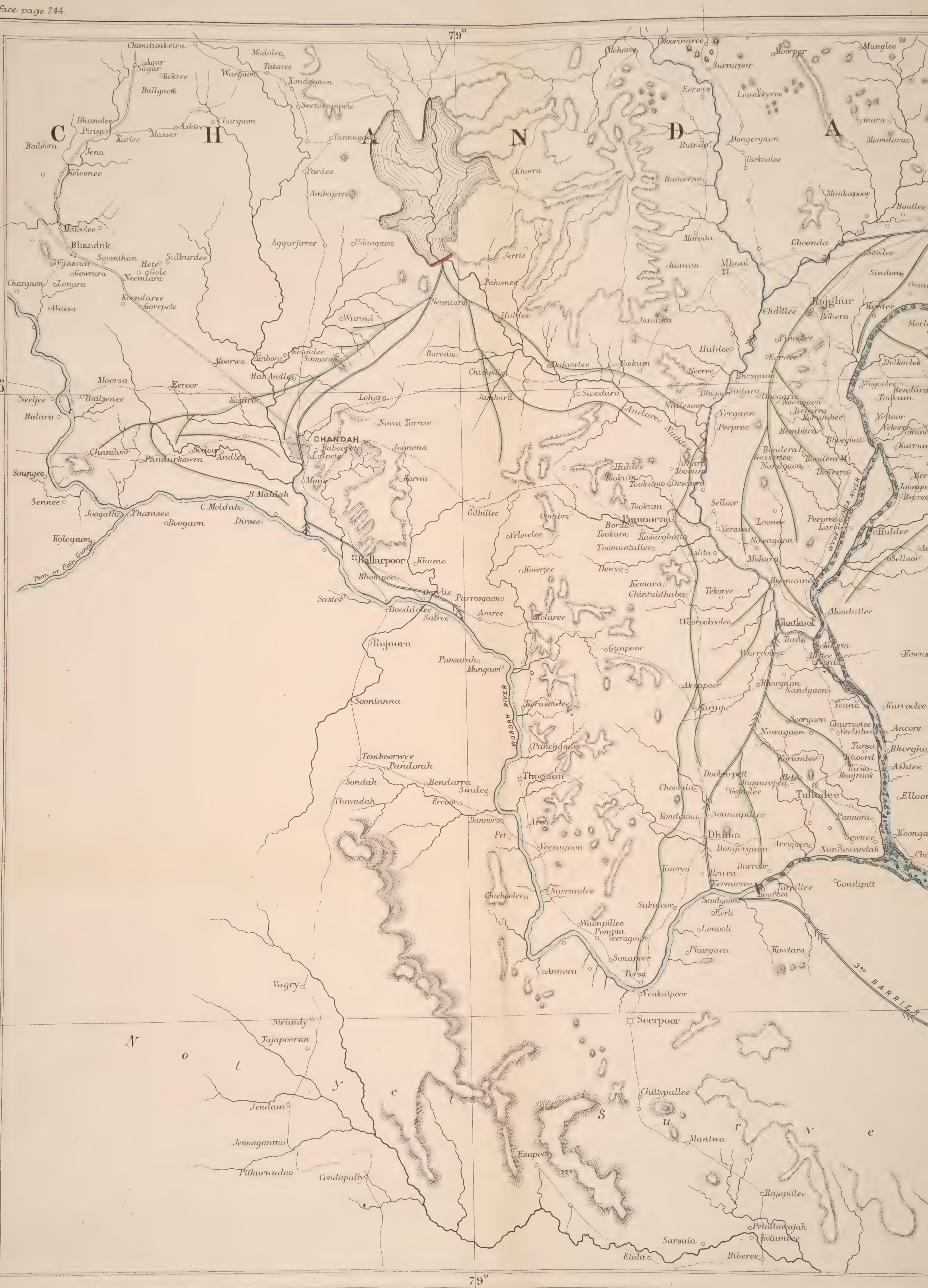
1st.—Whether there have been already losses of revenue from deficiency of water-supply, and to what amount.

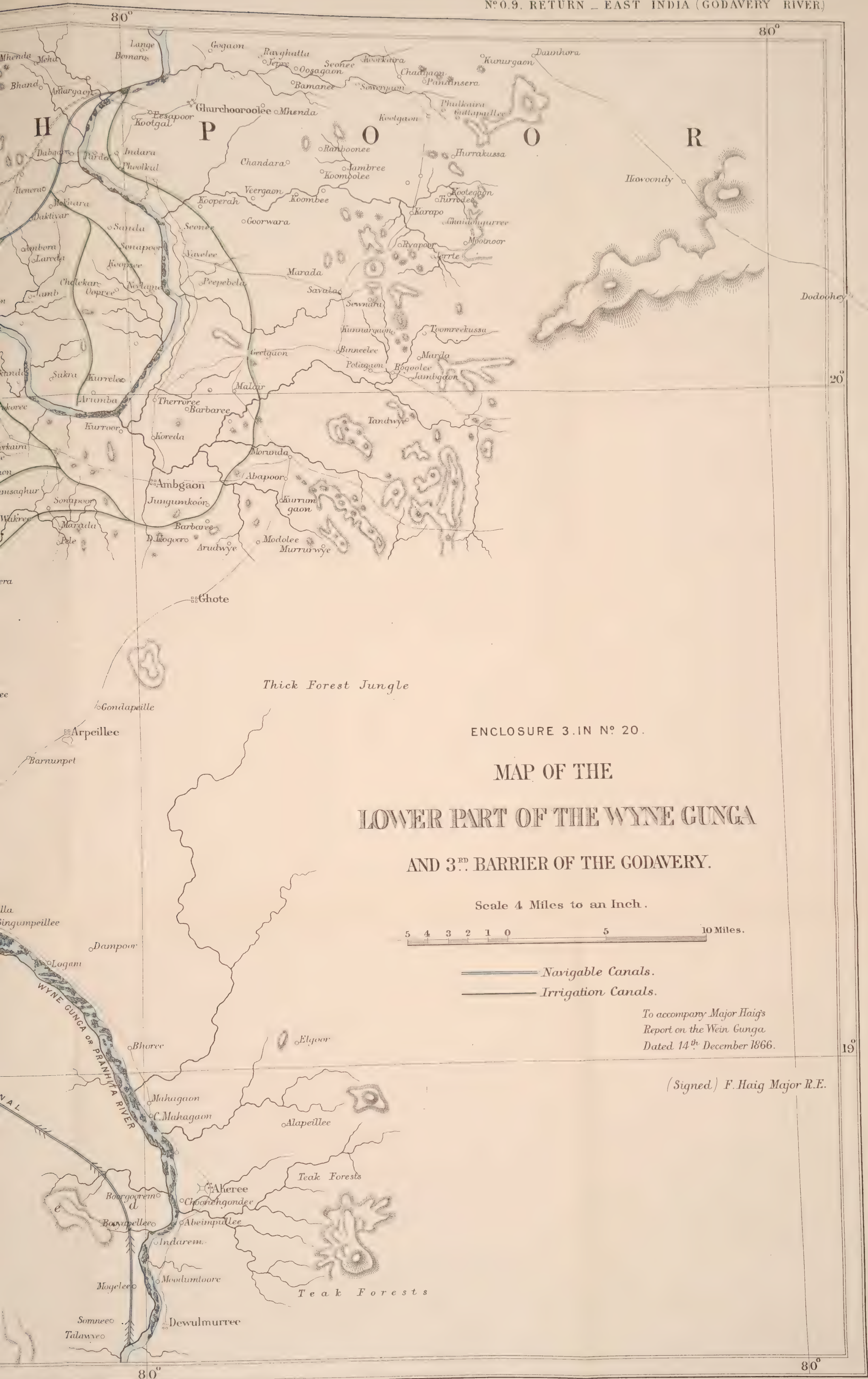
2nd.—The extent of the present deficiency, and in what month it begins to be felt.

3rd.—Its probable rate of annual increase.

4th.—The estimated total deficiency of the water supply for the second crop, when the whole of the delta lands shall have been brought under irrigation.

133. On receipt of such information, which doubtless could be obtained in the course of two or three months, the Government will be in a position to decide whether the demands of the delta alone will not render it advisable to take immediate steps for storing an extra supply of water. Should such prove to be the case, the formation of the Pench reservoir (should that site be selected) either of the full size for which it has been projected, or, possibly in the first instance, of only such capacity as the immediate demands of the delta may require, would apply the best possible test to the question of the suitability of that method





method of improvement to the Godavery and its affluents. This is the course I have always advocated. I have never been a projector of great reservoirs. I have always suggested that, in the application of this novel method of river improvement, we should proceed with the utmost caution, storing in the first instance only such a quantity of water as we know to be actually required for irrigation purposes, and then observing its effect on the navigable condition of the river down which it must pass to its ultimate destination. I cannot conceive any more simple, more cautious, more safe method of putting to a practical test a plan of improvement which has received the sanction of the first engineers in America, which would have been tried there ere now had it not been for the civil war, and which, even in this country, is admitted by a few to be deserving of investigation.

134. I have recommended this mode of procedure, not because of any doubts in my own mind as to the success of the reservoir system, but out of regard for the very natural and reasonable doubts of those who, not being accustomed to professional questions of the kind, may object to an expenditure upon works, the ultimate success of which appears to them to be doubtful. If the water is really and immediately required for irrigation purposes, there can be no risk of loss in storing, and so applying it.

135. I would not be understood from what I have just said, to deprecate the construction of such a reservoir as the Pench, supposing that there is a reasonable probability of its water being utilized for irrigation. Looking to the requirements both of the lands immediately under it in the Nagpoor valley, and of those in the delta, it is probable that the whole of its contents would be required within a very short time for this purpose. I quite expect that the result of inquiries in the delta, will show that that district alone could consume the whole of the water. If so, the Government would, I should hope, feel no reluctance in sanctioning the construction of such a reservoir.

136. If the result of inquiry into the present and prospective condition of the water supply for irrigation in the delta should be to show the necessity for storing at once a certain quantity of water for supplementing the summer discharge of the river, the construction of a reservoir for this purpose, and the application of its water in this manner, would fall in with the plan above suggested for dealing with the Wynegunga. The hot months, when the additional supply will be required, will be those when the navigation of the Wynegunga will be of the most value. The large expenditure still to be incurred to open the navigation up to Chanda, will probably require that the whole of the allotments available for the Godavery for some years to come, should be devoted to that line of navigation alone. To carry out the Wynegunga project in its entirety, as sketched out by the Chief Commissioner, may be financially impossible for a long time to come, and doubtless the Government will not embark in such an undertaking until fully satisfied of its practicability, or rather of the value of the navigation when opened; in other words, of the practicability of navigating the Wynegunga during the dry months.

The construction of a reservoir of a capacity sufficient to supply the present wants of the delta lands, would be a comparatively inexpensive undertaking, while at the same time a safe and remunerative one; and such a reservoir, when once in operation, would speedily afford most conclusive proof as to the practicability or otherwise, of rendering the river navigable by such means, and so remove all doubt as to the advisability of expending large sums upon its improvement.

137. Should this course be followed, and the result be that all the unobstructed portions of the Wynegunga should be found to be navigable during the time that the reservoir is in operation, the next work would be to clear the rocks requiring removal in the open parts of the bed, on the completion of which there would be a continuous line of navigation from Kamptee and the Upper Wynegunga down to the head of the Ghurchooroollee barrier. From that point to the Wurdah, at the head of the third barrier of the Godavery, the communication would have to be temporarily made by land, by means of the ordinary fair-weather cart-tracks, until funds should be available for the completion of the whole line of navigation by the construction of the canal from Ghurchooroollee to Dhaba above suggested, for turning the barrier. This is the order in which I should be disposed to recommend that the work of opening the Wynegunga navigation should proceed. On any other plan the work must, I should suppose, be postponed for many years, and after all would not be based upon such satisfactory data as this would afford.

138. It will be desirable that the necessary levels for determining the actual fall of the different sections of the Wynegunga and Kanhan, as above described, should be taken at once, and with these might be combined a survey of the second or Muggurdokra barrier, and of the Mohoda barrier in the Kanhan, together with that of four or five of the most rocky reaches in the open parts of the bed between the barriers. For this purpose, Supervisor D. Venkataratnum, who has had much experience in this kind of work, would be a very suitable person, and with the assistance of two qualified surveyors of a lower grade and a small staff of classies and peons, might finish the survey in a single season. The supervisor, who is, I believe, now attached to a division not far from Nagpoor, might be trusted to state the exact establishment he would require for this purpose. If he should be appointed to this work, I could send him detailed instructions for his guidance.

Enclosure 4, in No. 20.

(No. 172—2452, dated 22nd May 1867.)

From Major *C. Pollard*, R.E., Officiating Secretary, to Chief Commissioner of Central Provinces, in the Public Works Department, to Secretary to Government of India, Public Works Department.

I AM desired, in continuation of this office letter, No. 151—1866, dated 5th April 1867, forwarding Major Haig's Report on the Wynegunga, to submit to the Government of India another communication from that officer, strongly urging the examination of the country, with a view of testing the possibility of supplementing the waters of the Godavery by a series of reservoirs constructed on the Wurda or Wynegunga valleys; such increased supply being in Major Haig's opinion essential for the better navigation of, and development of irrigation from, that river.

2. The Officiating Chief Commissioner quite agrees that it would be a very desirable object to increase the volume of water, and admit of the employment of steamers of two feet draft, as well as the extension of irrigation in the delta, but he does not agree with Major Haig that it is a matter of no consequence whether it cost 500,000 L. or 5,000,000 L. sterling; and whilst recognising the advantages that would be gained by rendering the Godavery, Wynegunga, and Wurda navigable for 12 months of the year, Mr. Morris cannot concur in Major Haig's remark, "That the value of such navigation to the country would be far in excess of its cost, no one would be disposed to deny."

3. The Officiating Chief Commissioner gives the superintending engineer, Godavery Circle, much credit for the zeal and energy with which he endeavours to improve and utilize to the fullest extent the Godavery and its affluents, but he is of opinion that the scheme now advocated is premature. The question as to whether reservoirs of anything like moderate cost would materially improve the volume of water thrown down the main channel, has never been decided; and Mr. Morris cannot recommend an outlay on a costly experiment, whilst throughout India so many irrigation works of recognised value are in abeyance for want of funds to prosecute them. Under this view the Government of India will probably desire that Major Haig be informed that he should devote his best energies to prosecuting the work already sanctioned, and to the preparation of the third barrier schemes rather than schemes which are as yet theoretical, and possibly impracticable.

(No. 502, dated 13th April 1867.)

From Major *F. T. Haig*, R.E., Superintending Engineer, Upper Godavery Circle, to Secretary to Chief Commissioner of Central Provinces, in the Public Works Department.

I HAVE the honour to acknowledge receipt of your No. 151—1866 of 5th April, forwarding copy of the Chief Commissioner's letter submitting my report on the Wynegunga to the Government of India. It was not my intention to have reverted at the present moment to the Wynegunga question, but as my report, together with Mr. Temple's Minute, of 18th September 1866, will probably be sent to the Secretary of State among the papers referred to in para. 11 of the orders of Government of India, No. 195 C, of 8th March 1867, I lose no time in once more calling attention to a very important question connected with the general subject.

2. I greatly regret that the Chief Commissioner in his letter, of which you have now sent me a copy, has entirely omitted all reference to the very important fact which I so much dwelt upon in my report, that the water supply in the Godavery delta is already insufficient for the requirements of irrigation, and that my urgent recommendation that this point should be made the subject of immediate investigation has failed to meet with the support of the Chief Commissioner. I feel bound, however, again pointedly to draw attention to the fact, because, first, of its important bearing upon the question of the improvement of the navigation by means of reservoirs, and, second, because there is no need whatever for deferring inquiry into it until the orders of the Secretary of State upon the general project shall have been received.

I must be excused for insisting upon this point. I have now got hold of a fact, or rather of an official and public notification of a fact, the existence of which I was before aware of, though I could adduce no authoritative statements in support of it, and I must hold up this fact to the light, and urge its importance until some inquiry is made.

3. Surely that notification which I extracted from the "Rajahmundry Gazette," and gave at length in para. 129 of my report of 14th December 1866, on the Wynegunga, is of the utmost importance in connection with the reservoir question. I* shall reproduce it in an Appendix to this letter.

We have in it a distinct avowal by the collector of the Godavery District, that the summer discharge of the river is now so wholly insufficient for the irrigation, that it is necessary to prohibit second crop cultivation in three talooks. The water rate for one crop is 3 rupees an acre; for two crops, 4 rupees. Now, I have made no assertions as to their being a loss of revenue owing to this deficiency in the water supply, but what I have said, and would now reiterate, is this: Is it not worth while, is it not rather plainly obligatory upon us to inquire whether the prohibition of second crop cultivation in three important talooks of the delta is attended with a loss of revenue or not? Should not such inquiry embrace, further, the following very obvious questions: What loss of revenue has there hitherto been, if any, from

* I find the "Gazette" has been left behind at Doomagoodium.

from this cause? At what rate is the present acknowledged insufficiency of the water supply likely to increase? Cultivation is extending year by year with the extension of the distributary canals, but not above 700,000 acres are now watered out of the whole 1,000,000, or 1,200,000 commanded by the anicut. When the whole tract shall have been brought under wet cultivation, to what extent will the river supply in the dry months fall short of the demands of the second crop cultivation?

4. Surely these are points which have the most important bearing possible upon the reservoir question. What is the present position of that question? It is regarded as purely theoretical and speculative. However specious in appearance, it has never yet been tested by actual trial.

Discussion has gained for it a few advocates, but the scheme of "making a river" by pouring it out of a tank is still thought by practical men visionary.

No one, however, denies that, *if practicable*, it would so enormously enhance the value of the Godavery navigation that all controversy as to the extent to which the rivers should be opened out would at once be at an end. Let it but be demonstrated that the Godavery, the Wynegunga, and Wurda may be navigated the whole year round, or even for 10 months of the year, and it would be considered a matter of no consequence whether it cost 500,000 £, or 5,000,000 £ to make them so. That the value of such a navigation to the country would be far in excess of its cost, no one would be disposed to deny.

So long as this point is left in doubt, so long as the Government disbelieves in the practicability of such a scheme, there must be constant hesitation and endless checks to the progress of the undertaking.

5. Now, from one side it is satisfactory to think we are steadily advancing to a practical test of the navigable capabilities of the river. The shallow draught steamers, one of which may now be on the way out, will, when placed upon the river, very soon show what use may be made of it in its natural condition. What an amount of disappointment, doubt, and delay would have been saved, had such steamers been ordered when first I asked for them in 1861.

However, in 1868, we may hope to see them running. They will tell us what can be done with the river without any increase to its summer volume from artificial sources.

But however satisfactory the results of this test may prove, they will only show the more strongly how vastly the value of the communication would be increased were it practicable to use vessels of greater draught. If the steamers now building drew two feet of water instead of one foot, their resistance would only be increased one-seventh, though their tonnage would be doubled, and the tonnage available for *power* much more than doubled.

Hence a large reduction in the cost of carriage, the fundamental consideration in the whole matter.

I am not, however, going to weary the Government with a discussion of this somewhat omniscient topic, but what I wish to point out is this: if it is true that the Godavery delta is already in want of water for summer irrigation, about which the collector's notification leaves no room for doubt, and if such want is already causing a loss of revenue, and likely to cause very much heavier loss, which is matter for inquiry, then we have in our hand the means of testing, without risk of loss, the efficacy or inefficacy of the reservoir system of river improvement. If there is a sacrifice of revenue from want of water, it must pay to store that water, and pour it into the river for use in the delta, and as it travels down to the delta its effects upon the navigation can be ascertained. We shall then know beyond possibility of doubt the cost of storing a certain quantity of water, the benefit derived to the navigation from the use of such water, the total extra supply which the delta must have for its summer wants, whence we may infer the total probable amount of benefit the navigation will receive if the storage of water be limited only to the requirements of the delta lands, and can determine whether, considering that these improvements of the navigation will cost the State *nothing* (as the water rates alone will pay the interest), it may not be worth while to pour a yet larger quantity into the river for the navigation sake only.

6. I beg to say again, I am not assuming anything as proved in this matter beyond this, that the present water supply is insufficient for the delta irrigation.

But I submit that there is a strong *prima facie* case for investigation, and that such investigation is fraught with such important consequences that it should be entered upon without delay. It may bring to light facts which will give an entirely new complexion in the minds of many to the whole Godavery question, and show that an experiment which will set at rest all doubts upon the subject, may be conducted without possibility of loss,—nay, with the advantage of saving what *may* now be an annually recurring and increasing loss of revenue to the State.

I hoped that I had made this plain enough in my report on the Wynegunga, and my disappointment at finding that the point has altogether failed to attract attention, and that the matter is likely to be shelved for another year at least, must be my excuse for again pointedly drawing attention to it. Its investigation will commit the Government to nothing. What is now wanted is simply to ascertain facts, and I would submit that the investigation may well be conducted, pending the reply of the Secretary of State to the questions now to be submitted to him.

7. I have already indicated the main heads of the inquiry which, as proposed in my report, might be addressed to the Madras Government. I will add one more point. Sir W. Denison cherished a scheme for constructing a second anicut across the Godavery, about 40 miles above the present one at Dowlaiswarum, and watering from it a large extent of country, partly delta land, above the level of the other.

If irrigation works should now be carried out on a large scale, this scheme might receive attention.

If so, what increase to the summer supply of the river, already insufficient for the delta lands, would it involve?

8. I would suggest that the Madras Government should be addressed upon the subject generally, and requested to furnish the information under some such heads as those above suggested, which may enable the Government to determine whether steps should be taken for the construction of one or more reservoirs in the Wurdar or Wynegunga valleys, the primary object of which should be the supply of the present or prospective water demands of the Delta irrigation, and the secondary, but ultimately most important, the settlement of the *vexata quæstio* of the reservoir system.

Enclosure 5, in No. 20.

(No. 507 C, dated 11th July 1867.)

From Colonel C. H. Dickens, R. A., Secretary to Government of India, Public Works Department, to Chief Commissioner of Central Provinces.

No. 151—1868,
dated 5 April 1867.
No. 172—2452,
dated 22 May 1867.

I AM directed to acknowledge receipt of your secretary's letters, marginally noted, forwarding a report and a subsequent communication from Major Haig, on the subject of the navigation of the Kanhan and Wynegunga rivers, and increasing the supply of water for irrigation in the Godavery delta.

2. The Governor General in Council has carefully considered Major Haig's interesting report, but is not disposed to entertain any projects for extensions of the Godavery navigation works till those now in progress are approaching completion. As it will, however, be useful to ascertain the real facts of the case as to the alleged insufficient supply of water for irrigation in the delta, the Government of Madras has been requested to furnish information on this point under some such heads as those suggested by Major Haig.

Enclosure 6, in No. 20.

(No. 506 C, dated 11th July 1867.)

From Colonel C. H. Dickens, R. A., Secretary to Government of India, Public Works Department, to Secretary to Government of Madras, in the Public Works Department.

Report, dated 14
December 1866.
Letter, dated 13
April 1867, No. 502.

I AM directed by the Governor General in Council to forward copies of a report and letter by Major Haig on the navigation of the Kanhan and Wynegunga rivers, and the question of increasing the supply of water for irrigation in the Godavery delta.

2. The Government of India is not disposed to entertain any projects for extensions of the Godavery navigation works till those now in hand are approaching completion, but his Excellency in Council will be glad to be informed meanwhile of the real facts of the case as regards the alleged short supply of water for irrigation in the delta. I am, therefore, to draw special attention to paras. 129 to 136 of the enclosed report, and to Major Haig's letter of 13th April, and to request that, with the permission of the Madras Government, information on this point may be supplied as early as practicable under some such heads as those suggested by Major Haig.

— No. 21. —

(Public Works, No. 109.)

To His Excellency the Right Honourable the Governor General of India in Council.

Sir,

India Office, London, 31 October 1867.

Para. 1. I HAVE received and considered in Council your despatch, dated 11th July 1867 (No. 107), forwarding Major Haig's interesting report on the navigable capabilities of the Kanhan and Wynegunga, after a detailed personal examination of those rivers.

2. In approving of your orders to proceed at once with the completion of the Godavery works up to the foot of the third barrier, in my despatch, dated 14th September 1867 (No 86), I also expressed my opinion that there should be no delay in completing the necessary preliminary investigations above it. I would add, with reference to your remarks on Major Haig's report on the navigation of the Kanhan and Wynegunga, that these investigations should be completed,
rather

rather than commenced, when the works now in progress are approaching completion.

3. The very important statement brought to your notice by Major Haig, that the area of cultivation under the Godavery has already been extended so far as to cause a large deficiency in the present water supply, and that it has been found necessary to prohibit second crop cultivation in three talooks, properly received prompt attention from your Excellency's Government.

4. I perceive that a report has been called for from the Madras Government on this subject. If the views of Major Haig are corroborated, and it is found that the necessary supply of water for irrigating the Godavery delta is failing, the advisability of taking immediate steps for storing extra supplies of water, either in small or large reservoirs, should at once receive very careful consideration. In my previous Despatch I directed the completion of the survey of sites suitable for reservoirs within the basin of the Godavery, with a view to increasing the natural stream of that river during the dry season.

5. Major Haig asserts that the construction of a reservoir of a capacity sufficient to supply present wants in the delta would be a comparatively inexpensive undertaking, and be the best possible test of the question of the suitability of that method of improvement to the Godavery and its affluents. His proposition appears to me to commend itself to your early attention.

6. I look with considerable interest for the replies you may receive from the Government of Madras to your requisition for information on the condition of the delta cultivation.

I have, &c.
(signed) *Stafford H. Northcote.*

— No. 22. —

(No. 137.—Public Works.—Government of India.—Public Works Department.)

To the Right Honourable the Secretary of State for India.

Sir,

Simla, 17 August 1867.

IN continuation of Despatch, No. 64, of 8th April last, we have the honour to forward copy of papers showing the progress made on the Godavery Works to the end of the last working season, together with copy of our orders thereon.

Civil Works
Communications.

2. Her Majesty's Government will doubtless be gratified to notice the prospect held out of the early opening of the works on the 1st barrier.

We have, &c.
(signed) *John Lawrence.*
W. R. Mansfield.
H. S. Maine.
G. N. Taylor.
W. N. Massey.
H. M. Durand.
G. U. Yule.

Enclosure 1, in No. 22.

(No. 227—3050, dated 8th July 1867.)

From Major *C. Pollard*, R. E., Officiating Secretary to Chief Commissioner of Central Provinces, in the Public Works Department, to Secretary to Government of India, Public Works Department.

I HAVE the honour, by desire of the Officiating Chief Commissioner, to forward the following papers, being the Half-yearly Progress Report, ending 31st March 1867, of the Upper Godavery Works:

1. Statement showing progress and cost of works in Upper Godavery Circle.
2. Officiating Superintendent, Transport and Supply Departments, No. 120, dated 6th May 1867, on the operations of his department.

The Chief Commissioner has only to remark, in forwarding the above papers, that the progress in general would appear satisfactory.

STATEMENT showing PROGRESS and Cost of WORKS in UPPER GODAVERY DIVISION during Half-year ending 31st March 1867.

NAME OF WORK.	Quantities.		Per-centage of Work done.		Cost.		Per-centage of Cost of Work done.		Rates per 100 Cubic Feet.			Excess over or Saving on Estimated Rates per Cent.		REMARKS.		
	As in Estimate.	Done during Half-year.	Total done up to 31st March 1867.	During Half-year.	From 30th April 1863, up to 31st March 1867.	As in Estimate.	Actual of Work done during Half-year.	Actual to 31st March 1867.	During Half-year.	To 31st March 1867.	As in Estimate.	Of Work done in Half-year.	Of Work done from 30th April 1863, to 31st March 1867.		During Half-year.	Up to 31st March 1867.
1. Aicut masonry	782,675	93,793	439,486	11-98	58-70	3,20,914	24,657	1,66,697	11-16	75-45	28-22	28-28	36-28	6-37	+ 28-56	Expenditure during the half-year was on shutters, &c. The high rate of work during the present half-year is due to the high cost of cut-stone and contingent charges to masonry, pumping, &c. The quantity of cut stone done during the five months, viz., 7,432, is included in the quantity, 20,263 done in the half-year, being 36-6 per cent. of the whole; while the total cut-stone included in the total masonry built to date, is 9,674 against 255,076 cubic feet, or only 3-8 per cent. cost of cut-stone 13,000 rupees, contingent charges 1,780, included in the total cost of 17,249 rupees. The work during the half-year consisted of 238,443 cubic feet of rock excavation, and 1,652,334 earth-work. Total, as shown, 1,890,777; while the contingent charges for silt and minor excavations amounted to 412,263 cubic feet of earth-work not included in the actual progress. The increased cost during half-year is due to the depth at which the earth was excavated, and to the high rates paid for rock-cutting. The actual amount of work done for this work was 114,102 cubic feet, of which only 27,152, as shown, was actual progress, the balance, 86,950, having been in removing a temporary embankment, which forms a contingent charge against the remainder of the earth-work executed. Finished. The quantity of masonry executed was only 399 cubic feet, which had to bear the cost of 3,964 superficial feet of cement plaster at a high rate, as well as the cost of the iron gate, which in the estimate rate is distributed over the whole quantity of masonry, or 3,158 cubic feet.
2. Sluice-wall	200,185	-	184,527	-	92-17	71,430	1,715	82,366	2-40	115-35	35-68	-	44-65	-	+ 25-14	
3. Head-lock	256,962	20,263	255,076	7-88	99-26	88,457	17,249	1,12,407	19-49	127-07	34-42	85-12	44-06	+ 147-29	+ 28-00	
4. 1st Section of Canal earth-work	Detailed estimates not submitted.	1,800,777	13,040,044	-	-	-	28,634	1,32,613	-	-	(a) 10	Per 1,000 15-14	Per 1,000 10-16	(a) + 50-	(a) + 1-6	
5. Flood embankment	-	27,152	4,992,703	-	-	-	508	35,492	-	-	(a) 10	Per 1,000 18-70	Per 1,000 7-10	(a) + 87-	(a) - 31	
6. Cemetery wall	3,158	399	3,403	12-63	110-60	1,094	299	1,104	27-33	100-91	34-64	74-93	31-16	+ 116-31	- 8-77	
7. Accommodation for establishment	-	-	-	-	-	-	1,127	41,134	-	-	-	-	-	-	-	(b) Hospitals - 4,889 12 10 Branch Tramways - 441 6 6 Coolie Lines - 927 9 7 Station Improvements - 858 10 7 Recruiting - 15 10 - Arrears not charge-able to E. Accommodation for Stores and Establishment - 81 - Batta - 7,641 8 4 Weeding and Feeding - 1,334 13 4 Cattle - 2,765 4 10 Sanitary Operations - 1,009 9 6 Contingencies - 19,965 4 6
8. Tools and plant	-	-	-	-	-	-	5,203	-	-	-	-	-	-	-	-	
9. Manufacture of stock	-	-	-	-	-	-	7,383	-	-	-	-	-	-	-	-	
10. Repairs of tramway	-	-	-	-	-	-	2,117	-	-	-	-	-	-	-	-	
11. Miscellaneous charges	-	-	-	-	-	-	(b) 19,965	-	-	-	-	-	-	-	-	

(a) Figures filled in in the Superintending Engineer's Office.

ABSTRACT of First Five Items in the foregoing TABULAR STATEMENT.

	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Masonry	1,239,822	1,14,056	8,99,059	9-19	72-51	3,80,901	43,608	3,61,459	11-45	94-92	30-71	38-23	40-20	+ 24-48
Earthwork	-	1,917,930	15,032,838	-	-	-	29,442	1,68,105	-	-	-	15-19	Per 1,000 9-32	+ 30-90

Doomagudiem, }
22 April 1867. }F. T. Haig, Major, R.E.,
Superintending Engineer, Upper Godavery Circle.R. Rhind, C.E.,
Executive Engineer, 1st Barrier Division,
Upper Godavery Circle.

10 June 1867.

(No. 120, dated 6th May 1867.)

From *J. H. Dennison*, Esq., Officiating Superintendent, Transport and Supply Division, Upper Godavery Works, Coconada, to Superintending Engineer, Upper Godavery Works, Doomagoodium.

I HEREBIN be to submit report of operations in the Transport and Supply Division for the half year ending 31st March 1867.

2. The Transport and Supply Division, as reported since its commencement, comprises the following works :—

A.—Conveyance of provisions, engineers' stores, other departmental stores, as also passengers, public and private. This branch of the department is called the transport service, being divided into river and land transport. The former being subdivided into two reaches, viz., 1st and 2nd reach.

B.—Purchase, retail, and stowage of all provisions laid in stock for consumption of the labourers and artisans employed in the 1st barrier works, constitute the Supply Branch.

3. The tabular statement following gives cost of permanent establishment employed during the period, and proportion chargeable to Transport and Supply Branches, respectively :—

	Permanent Expenditure.	Transport.	Supply.
	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
1 Officiating Superintendent, for five months, at 450 rupees per month	2,250	1,125	1,125
4 Commander Flotilla, for five months, at 200 rupees per month	1,000	1,000	—
1 Sub-engineer, for five months, at 400 rupees per month	2,000	2,000	—
1 Overseer, for five months, at 180 rupees per month	900	450	450
1 Sub-Overseer, for five months, at 60 rupees per month	300	150	150
Office Establishment, for five months	2,357	1,269	1,268
TOTAL - - - <i>Rs.</i>	8,987	5,994	2,293

4. Establishment above shown, chargeable to Transport, is again to be divided as follows :—

	<i>Rs.</i>
1st Reach—River Transport	2,998
2nd " " "	1,498
3rd " " Land Transport Tramway	1,498

5. To come to the actual cost and carriage of all stores per ton per mile on the river, as well as tranway, the cost of the permanent establishment also will be added respectively, though not chargeable to works, as a rule.

6. The actual transactions of the division, with details, are as follows :—

TRANSPORT.

7. As already stated, this branch of the division is divided into River and Land Transport. The River Transport is subdivided into 1st and 2nd reaches.

8. The flotilla employed in the River Transport consists of steamers and boats distributed as follows :—

In 1st reach, viz., that between Dowlaishwarum and the 1st barrier, distance 96 miles, the—

Steamer *Prince*.
 „ *Shamrock*.
 Boats, two of 70 tons.
 Flats, six of 50 „
 Boats, two of 35 „

Steamer *Trevelyan* being rendered useless, is now about to be converted into a lighter.

9. In the second reach, between 1st and 2nd barriers, distance 85 miles, the—

Steamer *Arthur Cotton*.

„ *Rose*.

Boats, two of 50 tons.

Boat, one of 40 „

Boats, ten of 30 „

Steamer *Hope* being useless, lays in ordinary.

10. In the 4th reach, above the 3rd barrier, the—

Steamer *Mayflower*.

Boat, one of 30 tons.

1st REACH.

11. The steamers in the 1st reach have rendered similar services as heretofore, the *Prince* plying till the 20th November 1866, and then laid up for the season.

12. The cargo, as usual, consisted of provisions, machinery, materials, stores and treasure of the executive engineer, 1st barrier; small quantities of other departmental stores, as well as private stores and passengers; little or nothing scarcely is carried on the decks of the steamers, all cargoes being towed up by them in flats and boats. Heavy machinery received from England, *ex ship Dunphaile Castle*, has also been conveyed up this season to Doomagodium. Quantity carried for the period of this report is as follows:—

	Tons.
Total engineers' stores, one mile - - - - -	42,229
„ Divisional stores and provisions, one mile - - - - -	44,024
Other departmental and private stores, „ - - - - -	1,152
TOTAL Tons carried one Mile - - - - -	87,405

Passengers, the whole distance - - - - -	No. - - - - -	67
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13. The total expenditure in this reach for the period of this report, is as follows:—

	Rs.
Permanent establishment - - - - -	2,998
Temporary - - - - -	313
Labour and materials - - - - -	7,920
TOTAL - - - - -	11,231

14. The income derived on this reach amounts to 544 rupees, which, if deducted from total expenditure, will leave actual expenditure of 10,687 rupees for the carriage of stores, provisions, &c.

	Tons.
Total engineers' stores and machinery carried one mile - - - - -	42,229
„ Divisional supplies, provisions, &c. - - - - -	44,024
„ Private and other departmental stores - - - - -	1,152
TOTAL - - - - -	87,405

giving a rate of 1·9 anna per ton per mile. This compared with the past half year ending October 1866, shows as follows:—

	Total Tons carried One Mile.	Total Expenditure.	Rate per Ton per Mile.
Half-year ending 30th March 1866-67 - - -	86,253	10,687	1·9
„ „ 31st October 1866 - - -	62,689½	9,435	2·41
Difference more carried - - -	23,563½	1,252	·51

15. The rate above shown would undoubtedly have been more favourable had it not been that high rates had to be paid for hired boats conveying up division supplies, provisions, &c., the season being over for conveying them up by our own transport, sanction for purchasing of provisions arriving after the *Prince* had stopped working. Independent of the operations already detailed above, heavy and bulky logs of Pegu teak timber were conveyed to Gollagodium, being urgently required for lock-gates, which service was accomplished with great difficulty, and attended with heavy expense, and justly ought not to form

form a part in striking rates, consequently I have not included it in the legitimate work of the transport above shown; quantity of timber, and amount expended for conveying it up, being as follows:—54 logs, measuring 61½ tons, labour, 1,433 rupees.

2ND REACH.

16. The steamers and boats in this reach have done no work this half-year, as they were unable to ply on account of fall in the river at this season of the year.

17. The expenditure incurred on the steamers and boats laying in ordinary is as follows:—

	<i>Rs.</i>
Permanent establishment - - - - -	1,498
Temporary - - - - -	<i>nil.</i>
Labour and material - - - - -	784
Total - - - - -	<u>2,282</u>

LAND TRANSPORT TRAMWAY.

18. The tramway, as hitherto frequently reported upon, extends from Gollagudium (the terminus for all steamers and boats for landing cargo) to Doomagudium, a distance of 19 miles, Turbacca, a relay station, being midway, where cattle is exchanged; the working of this branch of the transport being so often reported upon, needs no comment at present.

19. The work done by the tramway consists of carriage of engineers' stores, machinery, divisional stores, provisions, and other departmental stores, private stores, work-people, and private passengers. The total amount of work done in carriage is as follows:—

	<i>Tons.</i>
Engineers' stores carried one mile - - - - -	4,010
Divisional stores, provisions, supplies, &c. - - - - -	15,449
Private and other stores - - - - -	585
Total Tons carried - - - - -	<u>20,044</u>

Number of workpeople and passengers for the whole distance - - - 385

20. The expenditure incurred in maintenance of the tramway is as follows:—

	<i>Rs.</i>
Permanent establishment - - - - -	1,498
Temporary - - - - -	460
Labour and material - - - - -	4,506

21. The amount of income derived on private and other stores, and passengers, 415 rupees, if deducted from expenditure incurred, will leave balance of 6,049 rupees as net expenditure incurred for conveyance of 19,459 tons one mile, giving a rate of 4·9 per ton per mile. This, compared with the operation of the preceding year, shows as follows:—

	<i>Tons.</i>	<i>Expenditure.</i> <i>Rs.</i>	<i>Rate.</i>
Half year ending 30th March 1867 - - - - -	19,459	6,049	4·9
„ „ 31st October 1866 - - - - -	26,836	7,835	4·83
Difference - - - - -	7,377	1,786	·7

22. The rate of carriage on the tramway has always been expensive, as reported by my predecessor, and at present the bad state it is in adds to it; but, as it is intended to abolish it, I need not go into particulars as to how it could be improved. Every attention was paid in keeping down expenditure in this branch, but the scarcity of horse-gram, and its high price, ranging 50 per cent. higher than what was paid hitherto, swelled expenditure, helping to enhance rate of carriage, though considerable reduction has recently been made in the petty establishment and labour.

SUPPLY BRANCH.

23. The transactions in this branch for this half-year are as follows:—

	Rs.
Total purchases in round numbers - - - - -	65,304
Total sales - - - - -	47,390
Total transfers - - - - -	11,179
Grand Total - - - - -	1,23,873

EXPENDITURE INCURRED.

	Rs.
Permanent establishment. - - - - -	2,993
Temporary - - - - -	1,244
Labour and materials - - - - -	4,193
Carriage - - - - -	76
Grand Total - - - - -	8,506

giving per-centage of 6·8, inclusive of Permanent Establishment, or 4·4 exclusive of it. This, in juxtaposition with the preceding half-year, shows results as follows:—

	Sales and Purchases.	Total Ex- penditure.	Rates	
			Inclusive.	Exclusive.
	Tons.	Rs.		
Half-year ending 30th March 1867 - - -	123,873	8,506	6·8	4·4
„ 31st October 1866 - - -	127,164	10,224	8·04	5·26
Difference Less - - -	3,291	1,718	1·24	·86

24. The outstanding advances of this branch, known as Brinjarry debts, the recovery of which has been found to be a difficult and tedious undertaking, their whereabouts being uncertain, consequently the sum of 2,287 rupees only has been recovered during this half-year with extreme difficulty, and at the cost of a purveyor over a large establishment of peons, travelling through the Upper Godavery district in search of defaulters, with what success has been already shown above. But lately satisfactory arrangements have been entered into with a party whose knowledge of the district and people leads me to hope that recoveries will shortly be made, it having been agreed and sanctioned by you that the moderate charge of 5 per cent. be paid for the recovery of all Brinjarry debts, thereby doing away with an establishment costing us above 85 rupees per month to little or no purpose. Taking into consideration the difficulty attending the recovery of these debts, as shown above, makes the commission of 5 per cent. comparatively moderate.

25. As all provisions for consumption had to be purchased on the coast at a time when rates were prevailing high, and much rice and other staples being largely exported, helped to keep up prices, the selling rates at Doomagudium being fixed, and the establishment unavoidably to be retained for receipts and issues, the expenditure incurred will doubtless appear large; but the nature of the work is such that expenditure cannot be any further reduced with safety to the interests of Government. Due regard has been paid to economy, with the view of keeping down expenditure, and every exertion put forward to reduce establishment to its lowest level by encouraging contractors for buying and selling provisions on their own account and risk, which, it is hoped, will effect the end in view; but as the system has only just been started, I hope in my next report to particularise favourable results of its working. Already some reductions in the petty establishment have been made in anticipation of its success.

Enclosure 2, in No. 22.

(No. 258-3392, dated 31st July 1867.)

From Major C. Pollard, R.E., Officiating Secretary to Chief Commissioner of Central Provinces, in the Public Works Department, to Secretary to Government of India, Public Works Department.

I HAVE the honour to forward (accompanied by a section of the 1st barrier anicut) Major Haig's Report on the progress and present state of the Godavery River Works.

The Officiating Chief Commissioner considers the state of the 1st barrier exceedingly satisfactory,

satisfactory, and, looking at the extra length of river which it will render navigable, he trusts that neither means nor men will be wanting next season to complete the work. Major Haig's exertions to obtain and retain workmen appear to the Officiating Chief Commissioner comparatively successful and highly praiseworthy, and the action taken by him, when cheapness of provisions in the coast districts caused his men to secede, was prompt and necessary.

It is exceedingly gratifying to the Officiating Chief Commissioner to hear that during the last season no cholera or other epidemic has shown itself at the Godavery stations.

The unhealthiness of the locality has been hitherto a sad bar to the prosecution of the work, and it is much to be hoped that delay from this cause will not again occur, as a succession of three or four healthy seasons often follow.

The Officiating Chief Commissioner is much interested in the arrangements described by Major Haig for overcoming the difficulties incidental to damming up the last outlet for the water in an economical manner, and regrets that the advent of the rains prevented his finishing that portion of the work to his own satisfaction.

Mr. Vanstavern's successful efforts in raising and fixing the heavy lock-gates are also noted.

Although but little actual work appears to have been done at the 2nd barrier, yet the Officiating Chief Commissioner considers that the time which has been spent in collecting materials and labour, and in making the station of Enchampilly habitable, has not by any means been thrown away. The anicut will progress the faster for it next season. The work done at the 3rd barrier also is by no means small or unprofitable.

The matter contained in Major Haig's interesting and exhaustive report speaks for itself, and renders it almost unnecessary for the Officiating Chief Commissioner to draw special notice to that officer's services; but it is worthy of remark that Major Haig not only works assiduously himself, but has the by no means common faculty of carrying his officers with him, and rendering their interest in the works almost, if not quite, equal to his own.

Mr. Rhind, on the 1st barrier, appears deserving of especial praise for his exertions to get the last gap closed up in the anicut.

Mr. Vanstavern's skill in using and improvising machinery must be useful on many occasions.

Messrs. Wells and Calliford appear to be subordinates of a high class.

On the 2nd barrier, Lieutenant Roberts had but a short time to distinguish himself in, but what he could do was done.

The survey at the 3rd barrier appears to have been carried on with speed and intelligence. Major Haig's commendation of Mr. Sieveking and Supervisor Venkutrathmun is deservedly high.

Referring to para. 15 of the report, which sets forth some of Major Haig's requirements to perfect his circle, Mr. Glass has already been appointed by the Government of India, and posted to the Godavery Circle.

The want of a second assistant at the 2nd barrier is not apparent to the Chief Commissioner at present. Further information will be called for; the works are all close together, and there appears to be as yet few workpeople to superintend.

Major Haig is very desirous that a telegraph station should be opened at Enchampilly, and his reasons for this are satisfactory to the Chief Commissioner.

The Superintendent of Telegraphs will, therefore, be addressed upon the subject, to the end that Major Haig's wishes may, if possible, be complied with.

The Chief Commissioner is aware of the peculiar necessity which exists for the services of an apothecary in such a climate as that of Enchampilly, and arrangements are in progress under his orders for procuring a competent man.

In reply to application for funds, Major Haig has been informed by the Chief Commissioner that all possible savings will be devoted to supplement the Godavery allotment.

(No. 769—1, dated 3rd July 1867.)

From Major *F. T. Haig*, R.E., Superintending Engineer, Upper Godavery Circle, to Secretary to Chief Commissioner of Central Provinces, in the Public Works Department.

As the working season is now at an end, the river having risen and put a stop to all work in the bed, it will perhaps be interesting to the Chief Commissioner to know what progress has been made with the various works in hand, and their present condition. I propose, therefore, to give a brief sketch of the operations of the season, to show how far they have come up to the programme with which we started, and what the present prospects are with regard to the time within which the different sections of the river may be opened for navigation.

2. The chief interest as yet centres in the 1st barrier works, the completion of which will at once throw open the river for use to a distance of 220 miles from the sea. These works, it will be remembered, consist of a weir, with two miles of canal, terminating in the river below the barrier, and connected with it by a pair of locks. A guard-lock at the head of the canal, and a large scouring-sluice at the lower end of the natural channel, which forms the upper approach to the canal, are the most important of the head-works. There are also some miles of heavy flood embankments. These works, when finished, will

afford a secure passage connecting the river above the barrier with the reach below. The latter, however, for a distance of 12 miles, is more or less obstructed by rock, and the clearance of a navigable channel throughout this part of the river is, therefore, a necessary adjunct to the works at the barrier itself, and is included in the project now under execution.

3. Until the receipt of the orders of the Government of India, dated 8th March 1867, No. 195 c, the operations were confined to the building of the anicut and head-lock, and to the earthwork of the canal. The uncertainty whether the original project, which included 23 miles of canal, would be ordered to be carried out or not, prevented anything being done at the tail-locks, which, as above mentioned, are to form the connecting link between the present canal and the river. The excavators were employed in widening the first two miles of canal only, in order to find them work until the orders of Government should be received. Thus, in regard to the tail-locks, and the clearing of the river channel below, the most important part of the season was lost. The most has, however, been made of the three months which remained, and I am able to report a fair amount of progress at all points along the whole line of operations. We have been providentially spared any outbreak of cholera or other epidemic, so that the works have proceeded without any special check or hindrance.

4. The first work to be noticed is the anicut, a longitudinal section of which accompanies. It will be seen that the river bed along the line of this work presents a profile which, at the left bank, is very nearly equal in elevation to the proposed crest of the anicut itself.

For about 360 yards out from that bank, the bed maintains this level. Then comes a sudden descent to a lower level, where the anicut is from 8 to 12 feet in height, which continues for another 300 yards.

* The greatest height is 28 feet, but this is only for a length of a few yards.

The bed then again falls three or four feet, and for 530 yards the anicut will be about 15 feet in height, till it reaches the deep bed of the river, which in its natural state forms the summer channel; and here, for a length of 505 yards, the height will vary from 18 to 24 feet.* It will be observed that, at the commencement of the season, the anicut was completed to its full height to a distance of 801 yards from the left wing-wall, and that for the next 457 yards, it was raised to within three feet of the proposed height. Beyond this was a gap of 438 yards, where the bed was untouched, and where the river flowed undisturbed in its natural channel. It was to the closing of this last gap that the operations of the season were confined. It was not intended to attempt to close it by a wall raised to the full height proposed for the anicut, or even to the height of the portion of the work immediately adjoining it, but to finish off at a level about four feet lower for one-half the distance, and six feet lower for the other half. In this, however, we have not succeeded. The quantity of work, the total number of cubic yards of masonry which the wall would have contained if built up to those levels, has actually been done, but it has been differently distributed. One portion of the wall is raised higher than was intended, while the other is lower; and in the middle, where the final closing of the two ends of the wall would have been made, the river has succeeded in staving off for one year more the forging of the last link of its chain. A gap still remains, 40 feet wide at top, and 15 at bottom.

5. It will be apparent from the foregoing description, that the closing of this last portion of the channel was a work attended with very serious difficulty. All the rest of the bed having been blocked up to a height of many feet, the only escape for the water which it was necessary to shut off, in order to build in the deep part of the bed, was through the sluices situated towards the left end of the work, and through these the water could only find sufficient vent when it had risen fully ten feet above its natural level. To dam a river against a head of water of that height, even with a rock foundation, would have been a most formidable undertaking, but happily the excellence of the cement which we use rendered the attempt unnecessary, and the greatest height to which the water was raised by the dams was only three feet above its summer level. The method employed was as follows:—When work commenced in January, the gap remaining to be closed was 438 yards in width. The bed was all under water, the river flowing over it with a current of three to five miles an hour, and discharging at that time about $1\frac{1}{2}$ million cubic yards per hour. As, however, by the month of May the discharge falls to some 250,000 cubic yards, it was evident that a considerable length of the gap might be closed without raising the water above more than a foot or two. The dams were therefore pushed forward from both ends for some distance without difficulty, and in the wall which was built behind them, openings like sluice-vents were left at a low level. When the water rose to this level with the gradual advance of the dams, it found sufficient vent without injury to the masonry; and thus, without raising the water more than three feet, the dams were finally closed from end to end of the gap. The openings will eventually be built up. They give the means, however, of completely controlling the river, and enormously reduce the expenditure and labour which on any other plan would have been necessary. While, therefore, this work has not been left in exactly the condition we desired, the total quantity of masonry has been built which we proposed to build, and the anicut is now so far advanced as to admit of its completion next season.

6. The Head-lock is finished, and the upper gates, and one leaf of the lower pair, hung. Great difficulty was experienced in raising and hanging the upper pair from their great height, 38 feet, and weight, each leaf weighing 11 tons. All the available tackle gave way, but Mr. Vanstavern succeeded, partly by levers, screw-jacks, and props, and partly by lifting from above, in setting them in their places. The embankment on each side has still

to be filled in for a width of 20 yards on each side to connect with the locks. We expect to pass through the lock all the boats with stores, 600 or 700 tons, for the 2nd barrier, in the course of the next six weeks, and any steamers which it may be necessary to shift from one reach of the river to the other.

7. *The Canal* is finished all but a little dressing of the slopes at a few points. Immediately above the head-lock, however, where there is a piece about 100 yards in length, which forms the connection with the river channel, it has been cut to a width only sufficient for boats to pass at present. More might have been done, but it was found necessary to cut down this part of the work to the lowest amount, and to send every available man to the tail-locks excavation.

8. *The Tail-locks*.—The progress made at this point has not been so good as I had hoped for, but still as much as the available labour permitted. Work could not be commenced until towards the end of March, but from that time all the labour that could be spared was put upon it. The great fall in the price of rice in the coast districts, which took place in the hot weather, induced a number of our men to desert, and it was only by a prompt reduction of our own selling rates, which I sanctioned in April at the urgent request of the executive engineer, that we prevented a secession which would have completely crippled all our operations. The excavation for the upper-lock, 30 feet deep, is now nearly finished. The last yard is now being taken out, and if the river should not rise more than a few feet for another fortnight, we may get the greater part of the floor and foundations of the side walls and culverts laid. Stone, lime, sand, &c., are all in readiness, and as soon as the bed is prepared, building will be begun at once. It is, however, not improbable that the river may soon rise to such a height as will burst the upper bank and flood the pit. If so, it is not likely that building can be begun before October. Still, even on that supposition, Mr. Rhind speaks confidently of finishing both locks by June next, and every exertion will certainly be made to secure that result. The completion of these tail-locks is the one work really necessary in order to open the canal for navigation during four months of the year, the river immediately above being quite practicable for navigation for that time even with the anicut at its present height; but I trust that, if funds are provided on the scale proposed in my budget estimate, nothing will prevent the raising of the anicut to its full height, and the final completion of the first barrier works by the time mentioned. We should, however, have been in a far more favourable position for attaining that end, and should have felt far more confident respecting it, had we had even *one* month's earlier sanction for the works.

9. *2nd Barrier*.—I have next to notice the 2nd barrier works. The progress made there has as yet been very small, but not more so, perhaps, than is unavoidable in starting a new work in such a locality, or than is even advisable on the score of economy. Indeed, it is but three and a half months to the present time since the executive engineer arrived there to commence operations, though he hurried up as rapidly as possible after making over charge of the first barrier works on receipt of the first telegraphic intimation of the orders of the Government of India. Labour has come in slowly, and has hitherto proved of a very fluctuating character. The prospects in this respect are, however, improving, and in another month, I hope Lieutenant Roberts will have a fair number of men upon the works.* His first care was to extend the clearance of forest as far as possible on every side. The site of the station, which has been selected with care, is, I think, the very best the country and the position of the works in the river bed admitted of. The officers' houses are placed on top of two small hills, rising about 60 to 80 feet above the surrounding country. There is now excellent accommodation for two officers and three subordinates, but as yet Lieutenant Roberts has been without an assistant. Lieutenant Jackson, however, left this place to-day to join him. The houses of the office establishments have been built some years, and are of a very superior description, situated on the river bank. Houses are in progress for other subordinates, and lines for the workpeople. There is already accommodation for some hundreds of the latter. A workshop, general store, and hospital are also in hand. Two station roads have been made, and all the most important drains have been cut. Every attention has, in fact, been paid to the two great requisites, drainage and clearing; but it is to be regretted that a large quantity of the trees and brushwood felled yet lie upon the ground, the rains having come on before it could be burnt. The jungle has also been cleared from a considerable extent of the face of the hill in which the quarries will be opened. The lines for some of the railroads have been marked out. Limestone quarrying is in progress at a rate sufficient to give all the stones that will be required for the present year, and quarrymen for the stone required for the anicut are being slowly collected. The whole of the machinery, tools, and plant for the works have been landed at Coconada, re-shipped on our river boats, and are now on the way up the canal from Coconada to Dowlaiswaram, the lower terminus of the river navigation. Two boat loads have already arrived here, and others are expected to-morrow. I trust no particular difficulty will be found in getting the most of them right up to Enchampilly, but as we are now reduced to only one effective tug steamer, and the uncleared reef of rocks of Albaka, half way between this place and Enchampilly, will render navigation impracticable after the beginning of October, some doubt must remain as to the actual quantity of such stores that we may succeed in getting up. The stores include, besides rails for six miles of line, more than 20 waggons and several cranes complete, needing only to be put together to be ready for use. I hope, therefore, that early in the cold weather the executive engineer will be depositing stone in the river bed in large quantities.

* He has at present 500.

It will be remembered that the works at this barrier consist simply of an anicut with a set of locks at one end of it in the river bed.

10. There will be no canal, as at the first barrier. Our object will be to complete them in three years, so as to open the navigation to the foot of the third barrier in June 1870. I think we ought, with proper arrangements, to be able to do this if funds are provided.

11. *3rd Barrier.*—The survey of the third barrier was commenced on the 27th March, Mr. Sieveking, assistant engineer, being in charge. The rains stopped it on the 16th June. It has been found impossible to complete it within the two and two-third months which intervened, though every effort was made for the purpose, and every available man sent to it. The distance from top to bottom of the barrier is about 33 miles by the most direct line, and 36 miles by the river. The country is mostly covered with jungle; a large amount of leveling is required, for almost all of which lines have to be cleared through the forest, which delays the works; and at both the upper and lower ends of the canal detailed surveys have to be made.

A careful survey, with levels of the river bed, was also required. About 100 miles of levels have been taken on land, and detailed levels and survey made of the river channel, but much yet remains to be done. The general result of the examination made this year has been to show that the construction of a canal involves no special difficulties. The head works would be simple, and the cutting at the head of the canal not above 10 or 12 feet. On the lower half of the line, however, a choice lies between two routes for the canal, either of which would be perfectly practicable, and neither more than moderately expensive.

The season unfortunately closed before the surveys and levels required to decide between the two could be completed, and this part of the work must, therefore, be postponed until next spring. This will delay the preparation of plans and estimates several months—a result which I foresaw, and to avert which I made the utmost efforts, but it was inevitable from the late date on which sanction for the survey operations was received. I spent the hot weather at that barrier myself, as the survey could not otherwise have been carried on, my knowledge of the ground and inspection of the results of the survey as they came out being necessary in order to direct the operations.

12. The survey party has now been broken up. Mr. Sieveking has been moved down to the first barrier. Supervisor Venkatarutnum has joined the second division. Mr. Spiers is still engaged in sinking some trial-pits in the neighbourhood of the proposed site for the anicut at head of third barrier; and Mr. Ward, who was temporarily engaged, and is paid out of the estimate, is, I hope, still employed in carrying a line of levels from the head of the barrier up to the top of the rocky reach, 60 miles in length, which Mr. Temple termed the first barrier of the Wynegunga. He will remain at Chandah during the rains, and will keep a register of the heights and velocities of water in the Wurdah, which will be of use in the final planning of the head-works.

13. The working season has thus closed with a fair amount of progress at all points along the river, not half what might have been accomplished had we received the orders of Government two months earlier, but as much as the limited time at our disposal admitted of. I have scarcely alluded to the operations of the Transport and Supply Division, because, as far as transport at least is concerned, its working season is only just commencing, the steamers having begun to run about 15 days ago. A large ship-load of stores has, however, been landed at Coconada, and is now on its way in our boats to the second barrier. I am happy also to report that one of the new river steamers, together with six barges, left Glasgow in April, and is now on the way out. I have directed the executive engineer in charge of the workshops to prepare an estimate for putting them together on their arrival, and I hope we shall have the steamer running next hot weather.

14. It will be understood from the foregoing sketch of the operations generally, that the season has been one of much toil and exposure to the officers and subordinates. At the first barrier especially the work has been very severe, having been carried on towards the close both day and night. Much credit is due to the executive engineer, Mr. Rhind, though worsted in the final tussle with the river, which rose and carried away his dams just as he had begun to build-in the masonry of the last small gap; he has succeeded in accomplishing the amount of progress we desired, viz., such as will admit of the finishing of the anicut next year. Mr. Vanstavern also is to be congratulated on his success in raising and hanging the gates of the head-lock without accident. Of the subordinates, Messrs. Wells and Calliford especially distinguished themselves. At the second barrier, Lieutenant Roberts has done all that could be done in the short time which has elapsed since he took charge; and, at the third barrier, Mr. Sieveking and his subordinate, Supervisor Venkatarutnum, exerted themselves to the utmost to make the most of the time at their disposal.

15. I must now advert to some of our most pressing *wants* :—

1st.—At the 1st barrier, Mr. Glass, whose appointment has for some time past been applied for, is much wanted, and it is very much to be desired that he should join as soon as possible.

2nd.—At the 2nd barrier, I find it will be absolutely necessary that the executive engineer should have *two* assistants, instead of one only, as I have provided for in the establishment lists sent up for sanction. I regret that I did not see this before, as I should have done, so as to give earlier notice, but the progress of the works has

has made it quite apparent, and I consider the appointment of a second assistant to that division a very urgent necessity. I think that the great importance of the work warrants my requesting that an officer may not be appointed at random, and without regard to any special qualifications. We do not want any remarkable talents, but we require a *young* man in the first place. Middle-aged gentlemen, much older in years and experience than the executive engineer, are not likely to serve under him contentedly and harmoniously. I particularly beg that such may not be sent. My executive engineers are young men, and they must have young men under them. What is wanted is an active energetic officer of ordinary intelligence, and if he is one who is willing to rough it for the sake of gaining experience in hydraulic works of the largest class, which he may not easily get elsewhere, he would have excellent opportunity within his reach at the second barrier. An assistant engineer, second grade, would do, and I beg that one may be sent as soon as possible.

3rd.—The opening of a telegraph office at Enchampilly is a very urgent necessity. I feel the need of it almost daily. It would have been of the utmost value at the time the river rose a fortnight ago. I was then at the second barrier, and could have given the executive engineer here 20 hours' notice of the approach of the flood, and instructions for his guidance. I believe that nothing is now required but that one or two signallers should be sent to Enchampilly, where there is a temporary house which they can occupy, pending the completion of a more permanent building. The short branch line which connects Enchampilly with the main line up the river has just been put in repair. I believe it was reported to be in working order a week ago. I beg, therefore, that arrangements may be made immediately for the opening of an office at that barrier. I would urge this the more because I fear from what I learnt from the deputy superintendent, whom I met near Sironcha last month, that the Telegraph Department contemplate the opening of the line next cold weather, and we cannot afford the loss of the communication till then, more especially when it appears to be actually ready for use.

4th. An apothecary is much wanted at the second barrier. I have already written about one in my No. 522—666, dated 17th April and 18th June 1867, respectively, but I fear before one can be sent we shall have painful proof of the need that exists for his services.

5th.—Sanction for the establishment lists submitted with my No. 501, dated 13th April 1867, is much wanted; and,

6th.—Orders upon the budget estimate forwarded with my No. 593, dated 14th May 1867, are very necessary. At present, the works are being carried on upon the assumption that funds will be forthcoming to the extent I have proposed. It is very necessary that we should have early intimation of the amount of the allotments for the year, that our plans may be shaped accordingly.

Enclosure 3, in No. 22.

(No. 610 c, dated 17th August 1867.)

From Colonel C. H. Dickens, R. A., Secretary to Government of India, Public Works Department, to Officiating Chief Commissioner of Central Provinces.

I AM directed to acknowledge the receipt of the Progress Report of the Godavery Works for the half year ending 31st March 1867, and the Report by the Superintending Engineer, giving an account of the works to the end of the season, received with your Secretary's letters No. 227—3050 of 8th July, and No. 258—3392, dated 31st idem, and to communicate the following observations and orders.

2. The progress reported is very fair, and the Governor General in Council observes with satisfaction that the whole of the first barrier works are expected to be finished by June 1868, and those of the second barrier two years later.

3. In regard to the third barrier, surveys only were ordered to be undertaken, and these have been in progress. But it would appear that at the date of Major Haig's letter, a line of levels was being carried to the top of the first barrier in the Wynegunga. This, I am desired to point out, is beyond the orders of the Government of India, given in Public Works Department No. 195 c of 8th March last, and contrary to those given in Public Works Department No. 507 c, dated 11th July 1867.

4. The Governor General in Council cordially concurs in the satisfaction expressed by the Chief Commissioner in regard to Major Haig's services, and those of the other officers* mentioned,

* Messrs. Rhind, Vanstavern, and Sieveking, and Lieutenant Roberts. Messrs. Wells and Calliford, and Supervisor Venkatarutnum.

mentioned, and desires that the commendation of the Government of India may be communicated to them.

5. With reference to Major Haig's allusion to establishments, I am directed to observe that early application should be made for sanction to all requirements on this account, so that everything may be in readiness against the next working season.

6. In the 15th paragraph of his report, Major Haig remarks that the works are being at present carried on upon the supposition that funds will be available to the extent proposed by him; and it appears that he has been informed by you that all possible savings during the year will be devoted to increasing the Godavery allotment. On this point I am to draw your attention to Public Works Department No. 529A of 5th June last, in which, after authorising a transfer of any savings which might accrue, it was said that, if during the course of the year it should be found that an addition was necessary, it should be applied for about December next, and that, meanwhile, the works should be carried on as rapidly as possible without stint of funds.

7. The last portion of these orders does not appear to have been communicated to Major Haig, and I am to suggest that, if this supposition be correct, a copy thereof should be forwarded to that officer.

8. In conclusion, I am to request that the Half-yearly Progress Report may, in future, be submitted with the Superintending Engineer's review of operations.

— No. 23. —

(Public Works, No. 124.)

To His Excellency the Right Honourable the Governor General of India in Council.

Sir,

India Office, London, 23 November 1867.

I HAVE considered in Council your Excellency's Despatch, dated 17th August (No. 137) 1867, transmitting Major Haig's very satisfactory Progress Report of the Godavery Navigation Works for the half year ending March 1867.

2. Much progress appears to have been made at the first barrier, subsequent to the receipt of the order of your Government to proceed with the works; and the exertions of Major Haig and his subordinates are fully deserving of the commendation that has been bestowed upon them.

3. The survey above the third barrier, without waiting for the completion of the works up to the foot of that barrier, has been approved in a Despatch from me, which you will not have received until after the dispatch of Colonel Dickens' letter, dated the 17th of August, on the subject of the Godavery Works.

I have, &c.

(signed) *Stafford H. Northcote.*

— No. 24. —

(No. 196—Public Works.—Government of India.—Public Works Department.)

To the Right Honourable the Secretary of State for India.

Sir,

Fort William, 29 November 1867.

Civil Works.
Communications.

WE have the honour to acknowledge receipt of your Despatch, No. 86, dated 14th September 1867, replying to our letter, No. 36, of 8th March, on the subject of the Godavery Navigation project.

2. In paragraph 5 you express a preference for the long over the short canal ordered by us at the 1st Barrier, and suggest that the blasting of the rocks, involved in carrying out the latter, will be found "a doubtful and difficult operation."

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Top of Flood Bank 200

196

162 LEVEL

CROWN OF AN

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73.00
69.00

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46.30
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36.29

39.70
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43.75

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34.70

35.60

35.00
44.60
39.20

37.80

0
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125
162
179
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715

1219

1409
1429

1638
1671

1790

1871

2023
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2135

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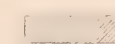
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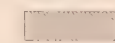
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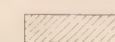
Reference.



Work Executed before January 1st 1867.



Do during Season of 1867.



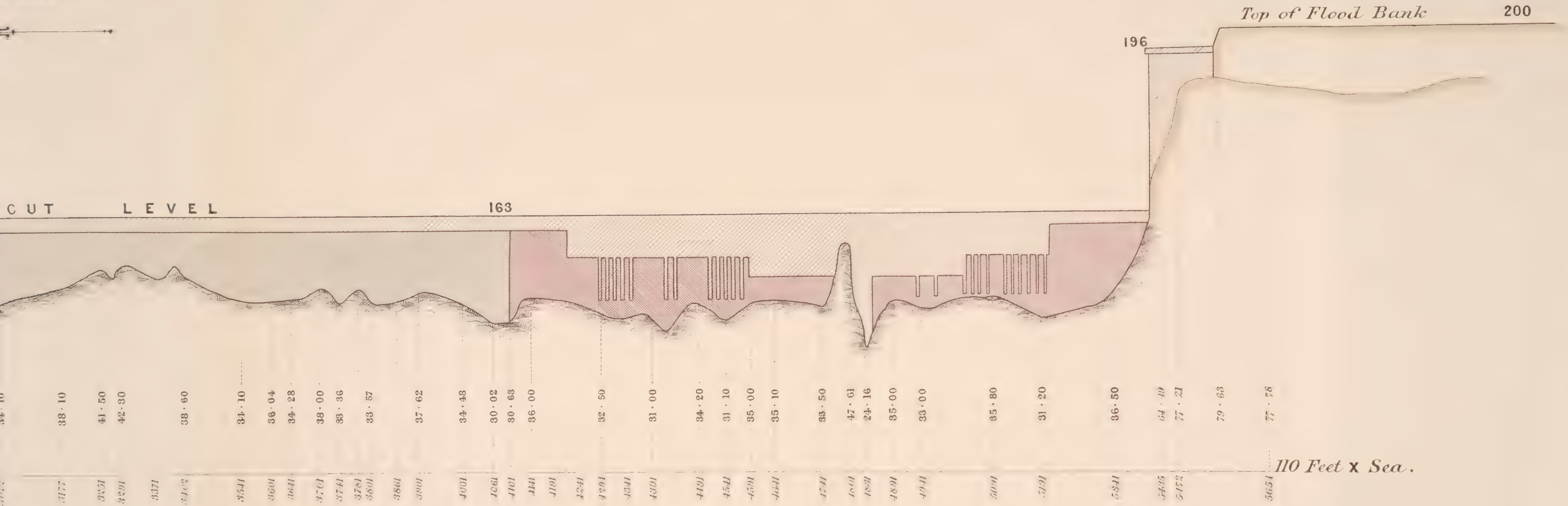
Work remaining to be Completed.

SECTION

ANNICUT.

RIER.

RIGHT BANK



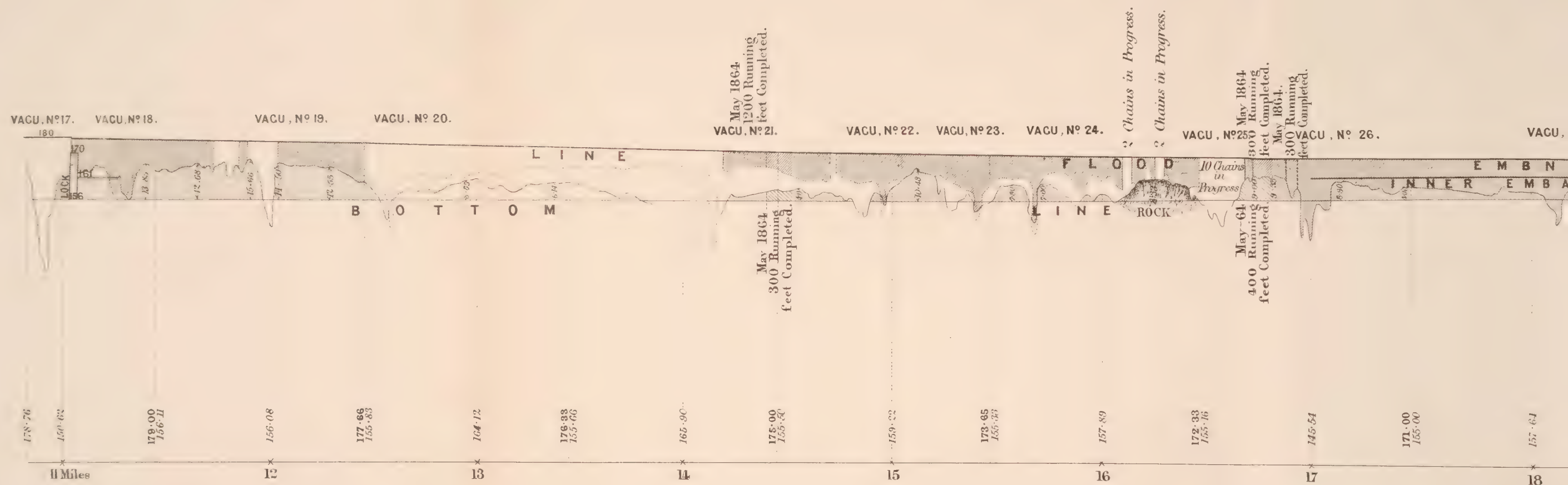
SCALES.

Horizontal 200 Feet to an Inch.
Vertical 20 Feet to an Inch.

(S^d) T. Haig, Major.
Super Engineer.

(S^d) R. Rhind, C.E.
Executive Engineer 1st B^d D^y.
Upper Godavery Works.

FIRST DIVISION OF
SECTION OF
FROM
VACU N^o 17 TO LOW



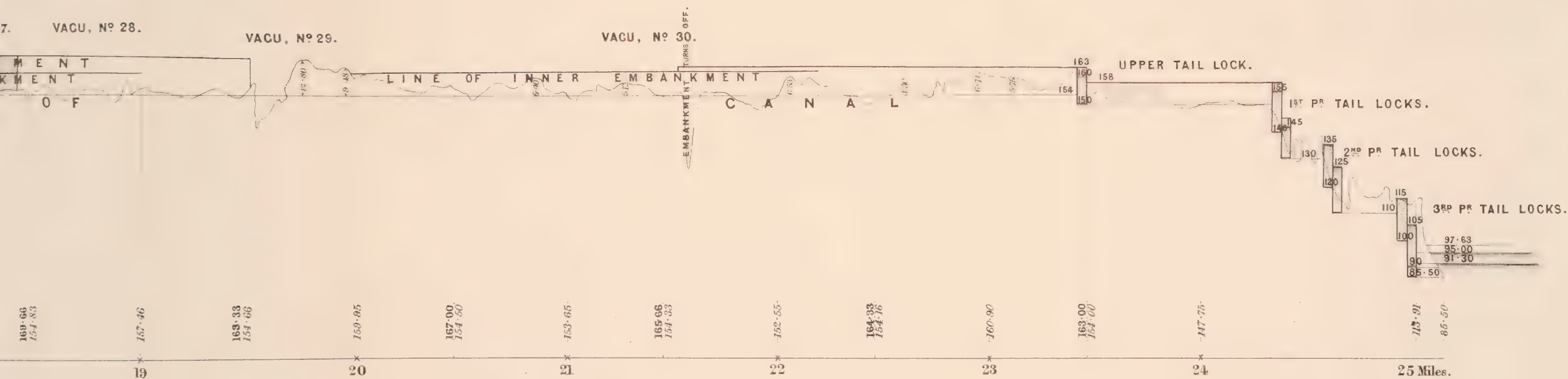
Reference.

Section showing work done to Embankment up to end of May 1863 & 1864.
Section showing work done to Canal up to end of May 1863 & 1864.

SECTION

CANAL

ER TAIL LOCK.

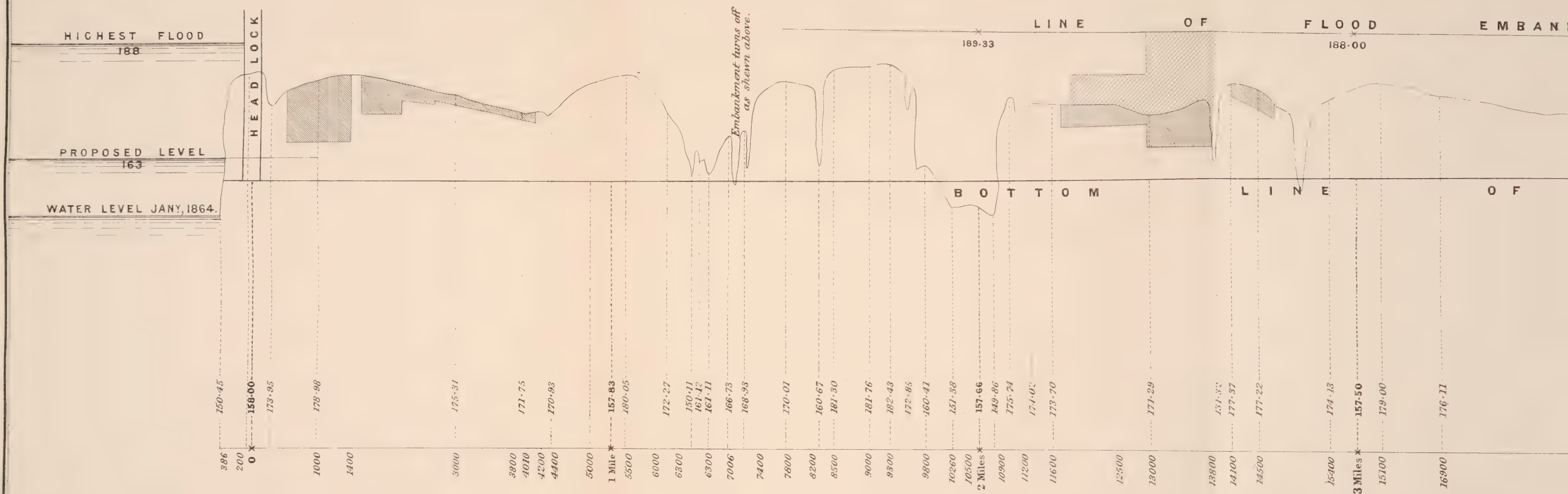
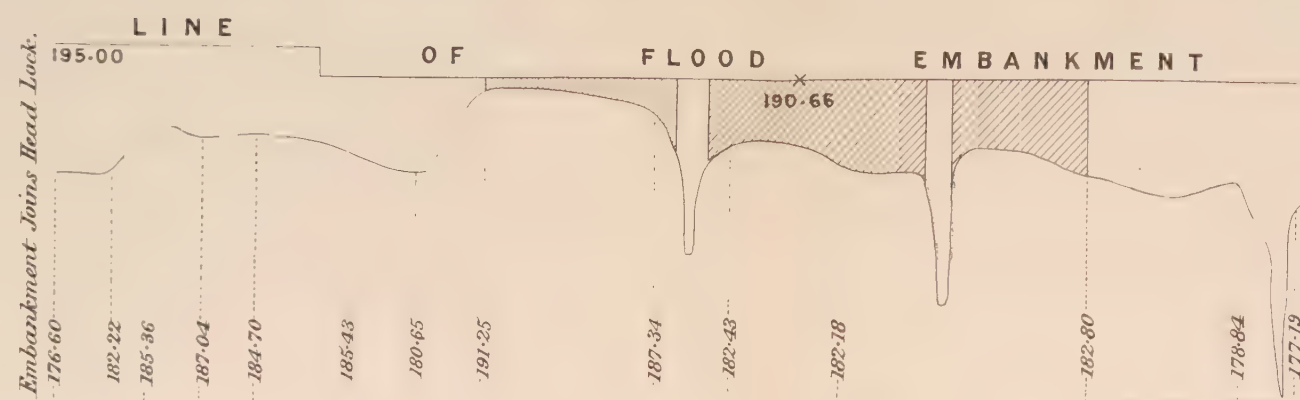


SCALES.

Horizontal 2 Inches to One Mile.
Vertical 10 Feet to One Inch.

Sd Thomas J Isaac CE
Ex. Engr 1st Br D.
Upper Godavary Circle

SECTION OF THROUGH 2ND SUB 1ST DIVISION



DATES		CANAL
From	To	Excavation.
May, -63.	May, -64.	2776035
May, -64.	Nov, -64.	415945
Total Cubic Feet		3191978

SCALES.

Horizontal 4 Inches to One Mile.

Vertical 20 Feet to One Inch.

CANAL

DIVISION

J.G.C.

N T

186.66

Handwritten notes and sketches in the center of the page, including a large 'L' shape and other markings.

C A N A L

From this Point the Canal follows the Course of Thurbaka Vagu and one of its branches to the 17th mile, where the 2nd and 3rd Sub Divisions meet; No Section is shown for this distance as no excavation is required.

20100 177.91

169.68

157.33

160.76

174.46

194.06

185.56

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181.00

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178.94

171.29

170.34

165.68

168.28

164.48

157.00

163.23

173.28

158.78

168.43

158.28

150.28

158.18

4 Miles

21221

5 Miles

26039

27179

27569

28987

29537

30937

6 Miles

32075

35186

35880

Reference.



Section showing Work done to Embankment up to Nov^r 1st, 1864.

Section showing Work done to Canal up to Nov^r 1st, 1864.

*J. S. Stoddard Major.
Asst. Engr. G. C.*

*Thos. J. Isaac C.E.
Engr. 1st Div. G. C.*

ration." With reference to this, it is only necessary to refer you to the Progress Report of these works which accompanied our letter, No. 137, of 17th August last. This shows that, at the end of March last, the short canal was almost finished, and that Major Haig anticipated no difficulty as regards the blasting of the rocks. Under these circumstances, it appears unnecessary to proceed with the long canal at present.

3. In the 7th and 8th paragraphs the early completion of the surveys for all extensions of the project, including the formation of reservoirs for increasing the natural stream of the Godavery during the dry season, is enjoined. We take this opportunity of forwarding copies of papers regarding surveys in progress, with a view of determining the best way of dealing with the 3rd Barrier, and of the orders issued by us in regard to this, and the survey of the Wyne-gunga and Wurda rivers.

4. The Chief Commissioner of the Central Provinces has been requested to expedite the submission of the estimates for the road from Mogellee to Chanda, referred to in your 9th paragraph.

5. With reference to paragraph 10, the Resident at Hyderabad has been called upon to submit an early report on the whole subject. On receipt of this reply, a further communication will be made to you. Meanwhile, we forward, for your information, copies of papers lately received by us in regard to the proposed exploration of the portion of the Godavery River within the Nizam's dominions, and the construction by the Nizam's government of roads to act as feeders to the river.

6. Although concurrence is expressed in paragraph 2 of your Despatch in our views as to the arrangements for the prosecution of the works, the general tenor of the Despatch appears to us rather to support Major Haig's views than approve the action taken by us.

7. We beg to state that one essential point in the proposals made by us, and approved in your 2nd paragraph, was, that all further surveys, in view to future extensions of the works, should be postponed till after the estimates for the 3rd Barrier Works should have been submitted to us. It will be seen in the proposal referred to in the 3rd paragraph, that we have allowed a portion of the surveys up the Wurda to be included in the project for the 3rd Barrier. Beyond this we would not go. We attach much importance to this orderly procedure, and to getting one thing done at a time in works so experimental in their character as these, and would accordingly request a re-consideration of this part of your orders. We may add, moreover, that, unless our demands for engineers are met, it will be impossible to undertake any additional surveys.

Vide para. 10 of Letter 36, dated 8th March.

8. We must, in conclusion, remark that the prosecution of the Godavery Navigation Works was ordered by the Government in England before the estimates were properly matured. This has led to large expenditure, and we believe actually to much delay. We are most anxious that the remainder of the operations should be conducted with system and order. Undue haste will not result in ultimate success, nor even in more rapid progress. We trust, therefore, that the arrangements we have made will be allowed to stand. We cannot hold ourselves responsible for the consequences if the measures recommended by us for curtailing operations connected with the Godavery project within reasonable limits, and for insisting on the prosecution of works upon carefully prepared plans and estimates, are set aside.

We have, &c.
(signed) *John Lawrence.*
G. N. Taylor.
W. N. Massey.
H. M. Durand.
G. U. Yule.

Enclosures in No. 24.

PUBLIC WORKS DEPARTMENT PROCEEDINGS, September 1867.

Civil Works.—Communications.

GODAVERY NAVIGATION WORKS, 3rd BARRIER.

Proceeding (C. W.—Communications.) August 1867, Nos. 46—52.

(No. 277—3717, dated 24th August 1867.)

[No. 26.]—From Major *C. Pollard*, R.E., Officiating Secretary to Chief Commissioner of Central Provinces, in the Public Works Department, to Secretary to Government of India, Public Works Department.

* No. 844, dated
20th July.
No. 846, dated
22nd July.

I AM desired by the officiating chief Commissioner to forward, for the perusal of his Excellency in Council, copy of two letters from the superintending engineer.* Upper Godavery Works, giving an account of the surveys in progress, with a view of determining the best way of dealing with the 3rd Barrier, and giving some remarks and proposals on the subject of the roads referred to in Government of India's letter, No. 195 c, dated 8th March 1867.

2. The object of the surveys on the 3rd Barrier is to determine whether it would be preferable to blast a clear channel through the rocks, or to turn them by a navigable canal as has been done at the 1st and 2nd Barriers.

3. Owing to some difficulties in regard to the selection of the best direction for the canal and position of the tail lock, the season closed before the full data were obtained to determine the question. This, the officiating chief Commissioner observes, is to be regretted, as it prevents the slack monsoon season being utilised in plotting the surveys, preparing and comparing the relative values and cost of the two schemes; but looking at the difficulties and dangers which had to be faced, and the extent of work to be done, Mr. Morris thinks Mr. Sieveking and his party have turned out a full season's work creditably.

4. The estimate for the completion of the examination and survey amounts to 6,211 rupees, of which about 3,672 rupees is for cutting jungle to allow the party to move. This has been sanctioned.

5. Major Haig takes the opportunity of pointing out that, in order to determine the best and most effective way of dealing with the barrier, and rendering the works equally advantageous for the navigation of the Wurdah and Wynegunga Rivers, a survey of the lower 60 miles of this latter stream is indispensable.

The officiating chief Commissioner concurs with Major Haig, into whose views on this subject he fully enters. It may be that the navigation works may not proceed further than the 3rd Barrier, but it would, in his opinion, be a flaw in this experimental scheme, if the works were not so designed as to admit of extension of navigation up both the Wurdah and Wynegunga, should a future generation desire it.

6. This administration has, however, a difficulty in meeting the call for establishments for this survey. Every effort will be made to do so, but the work requires special qualifications, and such as are not always met with in the upper subordinates of the department.

7. The superintending engineer also enters on the subject of a thorough exploration and survey of the Wurdah, with a view to the extension of navigation to the cotton mart at Hingunhât, and points out very explicitly that such a survey to be fully useful must be accompanied by a report on the places likely to prove useful as feeding reservoirs. He next takes up the subject of the survey of the Wynegunga, showing that already there are 233 miles of this stream almost navigable, and even in the event of its being determined, that Kamptee is not to be joined to the sea-board by a navigable channel, he points out that the wants of inland navigation alone call for improvements to this river.

8. What Major Haig urges as to the advantage to be gained by these surveys is, perhaps, incontrovertible, and the officiating chief Commissioner is alive to their importance. Indeed, he would be quite prepared to recommend the explorations of these valleys could an adequate establishment be spared for the purpose, but it cannot, and Mr. Morris thinks it would be a wiser course to allow these investigations to stand over, at all events until the completion of the works of the 1st Barrier shall liberate a portion of the establishment, and which may be reckoned on about July 1868.

9. On the subject of the roads little need be said, although, objecting to land carriage when opposed to water communication, Major Haig will doubtless complete this alternative
scheme

scheme as fully as his own navigation projects. He asks for sanction to an outlay of 966 rupees, and the services of a subordinate for the work.

10. The estimate has been sanctioned, and his other want will be supplied if possible.

11. But the province is now short handed, and no suitable man can at present be provided.

(No 844, dated 20th July 1867.)

[No. 27.]—From Major *F. T. Haig*, Superintending Engineer, Upper Godavery Circle, to Secretary to Chief Commissioner of Central Provinces, in the Public Works Department.

I HAVE now the honour to report generally upon the surveys required for those portions of the Godavery project which lie above the 3rd Barrier, including the barrier itself.

2. The orders of the Government of India, No. 1950, dated 8th March 1867, directing, para. 10, that the survey of the 3rd Barrier and Wurda River up to Hingunghât should be put in hand, were received on the 28th March 1867.

The greater part of the working season was over, but I made the best arrangements possible under the circumstances, despatching Mr. J. H. Sieveking, c.e., assistant engineer, to take charge of the survey with supervisor Venkutruthnum, a very competent surveyor, to assist him; there was afterwards added to the party Corporal Hogan of the F. company, Sappers and Miners, Mr. Speirs, supervisor, recently appointed on the temporary establishment, and Mr. Ward, who had lately been municipal engineer at Chanda, and who was engaged on the pay of a supervisor. Operations were commenced on the 27th March 1867, and ended about the middle of June. The survey party has since been broken up, as reported in my No. 769—1, dated 3rd July 1867, and Mr. Sieveking and Mr. Ward alone remain attached to it.

3. The party was engaged solely on the 3rd Barrier itself. No one was available for the Wurda Survey; the result of the season's work was that almost half was accomplished of what had to be done, and another full working season will be required for the completion of the survey, and the preparation of the designs and estimates.

4. The instructions given to Mr. Sieveking had in view the investigation of two alternative modes of overcoming the difficulties presented by the barrier, one by clearing a navigable passage through the river bed, the other by a lateral canal with locks. The season, however, closed before sufficient materials had been collected to guide to a decision between these two methods, and the best way of dealing with the barrier still remains an open question. A careful survey of the bed has, however, been made, though it has not yet been laid down on paper.

5. For the alternative, a lateral canal scheme, an extensive series of levels has been taken, sufficient to determine approximately the site for an anicut at the head of the barrier, and the direction of the upper 16 miles of the canal, half its own length. On the lower half of the line, however, two alternative routes present themselves, and the question of the best site for the outlet and tail locks is rather complicated. It is in this part of the line that our information at present is chiefly defective, and very close and careful investigation will be required before a decision can be formed. We are, however, now in possession of sufficient data to place beyond a doubt the practicability of forming a canal at a moderate cost. The ground generally is favourable, and there is no special difficulty of any kind. Of course as yet no attempt at any estimates, however rough, has been made.

6. With a view, then, to the completion of the plans and estimates next year, I have directed Mr. Sieveking to prepare a revised estimate of the probable cost of the surveys required, inclusive of that of the Wurda up to Hingunghât, viz., of the Wurda to the mouth of the Wurda Nuddee, and of the latter stream from thence up to the town of Hingunghât.

The estimate which I now submit for sanction amounts to 6,211 rupees, of which 2,275 rupees have already been spent. The principal item is the cost of jungle clearing on the different lines of levels which is necessarily heavy.

7. With regard to the establishment, the following arrangements appear to be required. Of those employed under Mr. Sieveking during the past season, supervisor Venkutruthnum has been transferred to the 2nd Barrier division. He was originally attached to that division, and it was only for want of an experienced surveyor that he was sent to the 3rd Barrier. His services at the 2nd Barrier are too valuable to admit of his being removed again, and he must, therefore, continue attached to that division. Corporal Hogan was, as reported in my No. 803, dated 10th instant, sent back to his corps on 31st May, and is since dead. Mr. Speirs, supervisor (temporary), will be immediately transferred to the 2nd Barrier division, where his qualifications as a mechanical engineer are likely to render him most useful. At present, in consequence of the above transfers, the establishments, 2nd

Barrier, is in excess of that submitted for sanction with my No. 501, dated 13th April 1867, but it will not be so when one of the subordinates is transferred to Albaca next cold weather, to superintend the clearing of rocks there. This work was to have been commenced this last season, but was postponed for want of superintendence, as reported in my No. 470, dated 6th April 1867. It is, however, urgently required, and must be put in hand this year.

8. It appears then from the above, that of the Survey Establishment employed last season under Mr. Sieveking's orders, only one man, Mr. Ward, will remain available for next year. Mr. Ward is not on the Establishment list, having been engaged in May as a temporary measure, for want of any one else, and is paid out of the estimate. I request that he may now be placed on the temporary Establishment as a supervisor, 2nd grade, with pay of 1st grade.

Besides him one good surveyor will be required to complete the 3rd Barrier survey, and I request that a man of experience, thoroughly expert at levelling and compass surveying, may be appointed.

He will not, however, be required before December next, as it will hardly be safe to enter those jungles before 1st January. The two lower subordinates now attached to the 3rd Division, but temporarily transferred to the other Divisions, will be available, so that no additional establishment will be required in this grade.

9. The establishment above proposed, viz.:

- 1 Assistant Engineer,
- 1 Supervisor 2nd grade
- 1 Surveyor of about the same rank and pay,
- 2 Lower Subordinates,

will be sufficient for the completion of the surveys and estimates for the 3rd Barrier. Mr. Ward will commence upon the survey of the Wurda in October, and will join the 3rd Barrier party on 1st January. But I must now add that the survey of the lower 60 miles of the Wynegunga is absolutely necessary to a determination of the best mode of dealing with the 3rd Barrier. The Barrier is situated at the junction of the two rivers, the Wurda and Wynegunga,—and as we must look forward eventually to the navigation of both, it is essential that the latter should be kept in view in planning the works for the barrier. It is not sufficient that these should be such as to satisfy the requirements of the Wurda navigation only, they must be capable of adaptation to that of the Wynegunga also. Indeed, if the views set forth in Mr. Temple's Minute on the latter river find acceptance, and the importance of the two navigations is to be measured by their respective lengths, and the relative extent, wealth, and population of their valleys, the Wynegunga will be entitled to the first attention, and no plans for the 3rd Barrier can be considered for a moment which does not form part and parcel of a plan for connecting the Wynegunga with the rivers below. To illustrate this, I may explain that it may possibly be found that a navigable channel may be cleared in the bed of the river itself at the 3rd Barrier, and that there may be no need for resorting to a lateral canal. If so, this method would satisfy all the requirements of the Wurda navigation, but the same plan may not be found applicable to the rocky parts of the Wynegunga in the last 60 miles of its course, and if a lateral canal must be substituted there, this would be an important consideration in favour of a similar canal at the 3rd Barrier, as it might be better to go to some extra expense to carry the canal right down to the clear water at foot of the Barrier, rather than to terminate it at the head of 25 miles of rocky channel. Thus the two questions must be considered together. The problem is to devise the best method of connecting both rivers with the Godavery, and this must of necessity be worked out, even though, in the first instance only, so much of the project be carried into execution as pertains to the Wurda alone. Hence the necessity for a detailed survey with levels of the lower 60 or 63 miles of the Wynegunga. This portion of the river is all more or less obstructed by rock. To the lower 30 miles of it, Mr. Temple gave the name of the 1st Barrier of the Wynegunga, but it was subsequently found that the obstructions extend over quite 60 miles, above that for a length of 108 miles the navigation is open.

10. I propose, therefore, to add one more surveyor for the purpose above indicated. His duty will be to make a careful survey of the bed of the Wynegunga with longitudinal and cross-sections, and to determine generally the line for a lateral canal. The expense of the clearing, &c., which will be required, has been included in the estimate.

11. I would observe that this inclusion of the lower Barrier of the Wynegunga is not intended in any way to lead on to the elaboration of a project for the navigation of that river. The preparation of such a project, and the surveys and levels required for it, form a separate scheme altogether, which I shall bring forward in the following paragraphs. If it should be decided upon, the survey of the lower 60 miles of the river might be included in it, as it properly forms a part of it. If not, this portion of the survey should, as above proposed, be added to that of the 3rd Barrier for the reasons already stated.

12. To sum up, then, my proposals for the completion of the survey of the 3rd Barrier, with the last 60 miles of the Wynegunga, we require—

1st. That Mr. Ward should be appointed a supervisor 2nd grade, on the temporary establishment, with effect from 1st August next.

2nd. That

- 2nd. That two other good surveyors of, perhaps, the same rank should be appointed in like manner to join Mr. Sieveking at the 3rd Barrier on 1st January next.
- 3rd.—That his establishment should be increased by one writer at 30 rupees, as a reserve in case of the one already sanctioned falling sick; and a draftsman on 50 rupees, to assist in the preparation of the plans and drawings, which will probably be numerous.
- 4th.—That sanction should be granted for the accompanying estimate for the 3rd Barrier survey, amounting to 6,211 rupees.

These arrangements, if sanctioned, should enable us to complete the surveys, and to have the designs and estimates for the works well advanced by July next; so much for the 3rd Barrier.

13. The next question to be considered is the survey of the Wurda to Hingunghât.

This was ordered by the Government of India in their No. 195 C, dated 8th March 1867, paras. 8 and 10; but as I have already reported, the establishment available during the last season was altogether insufficient for the purpose, and the survey has, therefore, yet to be made. The intention of the Government of India appears to be that the survey of this river shall be kept altogether distinct from the question of additional water supply. It is to be undertaken at once as a separate work, unconnected with any project for storing water. All such projects, it appears from the orders above quoted, are to be postponed until the receipt of the orders of the Secretary of State regarding the 3rd Barrier works. I must, however, point out that the question of an additional water supply for the Wurda navigation is altogether distinct from that of the improvement of the navigations below the 3rd Barrier by the same means. In the latter case the question does not press for immediate investigation; the rivers are navigable in their natural condition, (the Barrier works being supposed to be complete) for six or eight months of the year, and with the new steamers will be navigable for a still longer period. This, however, is not the case with the Wurda; a steamer drawing two feet of water can only navigate it during three months of the year, from July to September. It follows, therefore, that to place this river on a similar footing with those below the 3rd Barrier, in regard to the duration of the annual period of navigation, some means must be devised for remedying the defect of insufficient depth of water during five or six months of the year. A mere survey, therefore, which would afford the data for estimating the cost of removing the few scattered rocks, which alone obstruct its course in the 100 miles above the 3rd Barrier, would be altogether insufficient to determine the practicability and cost of extending the navigation up to Hingunghât. The defective water supply must of necessity be taken into consideration, and some means devised for obviating this difficulty.

14. It will be desirable to describe in more detail the actual condition of the river in regard to navigation, that there may be a clearer understanding of what is required in the way of improvement. The average slope from the head of the 3rd Barrier, to the mouth of the Wurda Nuddee, 25 miles from Hingunghât, is one foot per mile. From the 3rd Barrier to Chanda the slope is less than this, above that point more $1\frac{1}{2}$ foot per mile. The width between banks is 500 yards at the Barrier, diminishing to 200 and 250 higher up. The only obstructions are rocks, which occur at three or four points, loosely scattered over the bed, and which, though troublesome and even dangerous, do not prevent navigation. Their removal will be a work of small expense, so that they may be dismissed from the mind, and the river regarded as perfectly available for navigation, was there but the requisite depth of water. With regard to the latter point, we know that a steamer drawing two feet of water can run during three months of the autumn, but that even then there may be interruptions arising from deficiency of depth at a few points. The effect of the anicut, if one is to be built at the head of the 3rd Barrier, will be to throw the water back on a level for about 30 miles, which would submerge the worst known shoals in the river. Above this pool there would then be 70 miles of river, respecting which we have to ascertain what would be the effect of clearing passages through the few rocks met with, and which generally cause the worst shoals; whether this alone, or with some little help from training walls at a few points, would not make the river navigable for steamers of two feet draught without interruption for three or four months, or for boats for a longer period. We have also to ascertain for what length of time the river improved only to this extent would be navigable by steamers, such as those now on the way out, with a draught of only one foot. Undoubtedly it would be so for a considerably longer period than for vessels of two feet draught, and we have yet further to determine what addition to the natural volume of the stream it would require still further to extend this period till it corresponds with the navigable period of the river below the 3rd Barrier down to the coast. It is very evident that the stream required to give an available depth of one foot at the few shoals met with in a river with such a moderate fall as the Wurda must be small, and the probability is, that the extra supply required to maintain the stream in that condition for the few months during which such help would be necessary would be comparatively trifling.

15. It will appear then, from the above that the investigations, which the case of the Wurda requires, extend much beyond a mere survey of its bed with levels. We need also careful observation of depths at the shallowest points, and discharges during several months of the year, and further, some estimate must be made from the data thus obtained of the quantity of water it would be necessary to store up to supplement the natural supply; and lastly, an examination should be made of the hills on the upper part of the river, with a

view to selecting a site for a reservoir. I fear the mention of this last word will suggest ideas of vast lakes of fabulous dimensions, costing immense sums of money, and to repel practical minds accustomed to view all such questions with constant reference to the available resources of the Government from any consideration of the question. But I believe it will be found that the reservoir required in this instance will be of such extremely modest dimensions that it may be classed with some of the large, and by no means the largest, tanks with which India is covered. I mention this simply with a view to encouraging investigation, and to guard against any foregone conclusions on the subject, for which there are really no sufficient grounds. What is needed, and what I would now urge, is inquiry; that, with a view to giving effect to the orders of Government, and determining the probable cost, and most suitable method of carrying navigation up to Hingunghât, the capability of improvement of the Wurda should be made the subject of careful investigation in the order of inquiry which its natural condition suggests, viz., the improvement derivable, (1), from clearing away rocks; (2), from the use of light draught steamers; and (3), from the augmentation of its natural supply from artificial sources, and it should at the same time be distinctly understood that the question of improvement to the extent last mentioned is to be considered quite independently of that of the suitability of the same system to the rivers below, and with reference only to the very limited requirements of the Wurda itself. The alternative method of improvement, by means of a series of dams, placed at such intervals as to form a succession of still-water pools throughout the whole length of the river, has also to be considered, so that in sanctioning the investigation now proposed, the Government would be in no way committed to either system, but would merely determine the comparative merits of each.

16. The establishment that would be required for this purpose would be—

One assistant engineer.

One surveyor, say supervisor 2nd grade.

One native surveyor.

Two years would probably be occupied in the investigation. The work of the first would consist of the river survey, and taking an extensive series of levels and profiles of the bed, both longitudinal and transverse, together with careful measurements of depths and discharges at fixed point. In the second year, the observation and record of depths and discharges would be continued, but the examination of the hills for sites for reservoirs would be undertaken, and, perhaps, the detailed survey and levels required for estimating for one reservoir would be made. Such a careful practical investigation of the question could not fail to afford most valuable and interesting results, and important contributions to the elucidation of the subject of water-supply generally. Rain registers would be kept at suitable points upon the hills, and a complete set of data collected, upon which reliable estimate could be framed, and from which a definite scheme, which from the very nature of the case would not be very expensive, could be elaborated.

17. I would strongly recommend this mode of conducting the inquiry. It would prove, I think, quite as satisfactory to the Government as to myself; it brings within a narrow and very practicable range the investigation of a system of improvement of wide application, and would at once remove from the regions of doubt and speculation, questions which have been the subject of much controversy, and which can be showed in no other way.

18. I would, in the next place, draw attention to the Wynegunga, and in proposing that a detailed survey of it should be made next season, I would distinctly disclaim any intention or desire to commit the Government in any way to any further development of the Godavery project, than that which has been determined upon, pending the orders of the Secretary of State, viz., the extension of navigation to the foot of 3rd Barrier only. It may appear unnecessary, so long as the question of opening the 3rd Barrier remains undecided, to consider any proposition for further examinations of the rivers above it, but I would beg to point out that the question of the navigation of the Wynegunga is independent of the decision at which the Government may finally arrive respecting that Barrier; if the navigation is to stop at foot of the Barrier, the communication with Chanda is intended to be completed by a road, and the navigation of the Wurda will be abandoned, but the same result will not follow in the case of the Wynegunga. Even supposing a road to be made instead of a canal round the lower 60 miles of that river, there still remain above that point 233 miles of navigable river, if Mr. Temple's estimate of the navigable capabilities of the Wynegunga be correct (and it must be remembered that it was subsequently confirmed by my own personal examination of the river from near Kamptee to its mouth); now this length of navigation, traversing as it does, as Mr. Temple has pointed out, a valley with a population of 2,000,000, would certainly, if improved, become the channel of an important traffic, even if the connecting limb with the Godavery below was nothing better than a road. Hence it appears plain that the question of the navigation of the Wynegunga is independent of that of the 3rd Barrier, and may be separately considered. Whether road or canal be adopted at the 3rd Barrier, the Wynegunga above will have a distinct and independent traffic of its own. The intervention of a road, though perfectly effectual in extinguishing water-communication above on the line of the Wurda, would not have the same effect on the other river. However much it might hamper and obstruct, it would not altogether prevent traffic on the 200 miles of the Wynegunga. I would, therefore,

fore, submit that there is no need for postponing the professional survey of this river, and would recommend that it be taken in hand at once.

19. There may remain, however, an objection, which I should, perhaps, notice, viz., that to set on foot a fresh scheme of the kind, would have the effect of drawing away my attention from the works now in hand, and which require all my time and energies for their effective supervision. It was on this ground that the Chief Commissioner was pleased to negative my recent proposal for a six weeks' absence during the monsoon on an exploring trip down the Godavery Proper; I would observe, however, that my own presence would not be required upon the spot for the survey in question, and there is no reason why it should engage my attention for a moment from the time that the officer appointed to it had received his instructions, until he submits his final report, when it will rest with the Government to determine whether any further action should be taken in the matter, or the survey might be conducted under the orders of the chief engineer, or of the superintending engineer, Northern Circle, which would have the double advantage of relieving me from all the temptation to waste my time in speculating about new projects, and of placing the matter in the hands of abler and perfectly unbiassed men, so that this objection may, I hope, be removed.

20. As to expense, I need not allude to this as a consideration, as it would of course be utterly insignificant in comparison with the interests involved.

21. With regard to the general question whether the information we already possess furnishes a sufficient *prima facie* case for further investigation upon this point also, there is no need, after Mr. Temple's Minute upon the subject, for my offering any remarks. The immense value and importance of such a navigation, if practicable at a reasonable outlay, will be conceded. I merely propose that we should now ascertain approximately at least what outlay would be required. That the river is navigable for a part of the year from near Kamptee to its mouth is beyond a question. I suggest that the extent to which the navigation is capable of improvement should be made the subject of special investigation. There is no reason for postponing such investigation. Granting that years must pass before any scheme for opening the river could be put in hand, still past experience shows that a year will elapse in any case, even after the preliminary inquiries have been made, for action in this country ever follows at long and dreary intervals in the wake of discussion. Might I not also suggest that, independently of the navigation question, when a great river flows down the centre of a magnificent valley like that of the Wynegunga, whose gently sloping sides stretch away in vast plains on either bank, so singularly adapted for irrigation, the determination of the longitudinal profile at least of the river of its various slopes, and the advantages which it may possibly offer at certain points for leading off its waters to the adjacent lands, is a matter of the greatest interest, and will become a fundamental necessity whenever the irrigation of the country may be taken in hand on a large and comprehensive scale.

22. With regard to the establishment that would be required for this purpose, I think that an officer, with three good surveyors, would be sufficient to do the work in one season; a continuous survey of the river would not be required. There are already sufficiently accurate maps of it. A longitudinal line of levels, with numerous cross-sections and detailed plans of those parts of the bed which are obstructed by rock, would be required, and for these, I think, the above establishment would be sufficient. Operations might be commenced on the upper part of the river, where it passes through an open and well-cultivated country, soon after the rains, and the lower part which flows through a partially forest and less healthy tract would then be reserved for the hot weather, when there is least risk of fever. In fixing the establishment at this amount, I suppose the lower 60 miles of the river to be left to the 3rd Barrier survey party.

The cost of establishment might then be one assistant engineer, 1st class, for one year, three supervisors, 2nd grade, for one year.

23. The establishment, which I have above stated to be required for the several surveys proposed, are as follows:—

3rd Barrier Survey, including the lower 60 Miles of the Wynegunga.

- 1 Assistant Engineer, 1st grade.
- 3 Upper Subordinates.
- 2 Lower Subordinates.

Survey of the Wurda.

- 1 Assistant Engineer, 2nd grade.
- 1 Upper Subordinate.
- 1 Lower Subordinate.

Survey of the Wynegunga.

- 1 Assistant Engineer, 2nd grade.
- 3 Upper Subordinates.

Of these, one assistant engineer, first grade, two upper subordinates, and three lower subordinates, are provided for under the head "3rd Barrier Survey," in the establishment lists submitted for sanction with my No. 501, dated 13th April 1867.

Owing, however, to the transfers explained in my 7th para., neither of the two upper subordinates, and only one of the lower, is available. These, therefore, must yet be appointed to make up the establishment already applied for.

24. The establishments required for the surveys of the Wurda and Wynegunga are in excess of those entered in the lists submitted for sanction, the total annual charge for which amounts to 1,46,096 rupees. But in the Budget Estimate submitted with my No. 593, dated 14th May 1867, I entered an extra sum of 20,000 rupees, which I then explained to be intended to cover the cost of survey now proposed. The portion of this which would be absorbed by the establishment above proposed for the Wurda and Wynegunga surveys would be about 12,000 rupees, thus :—

	Rs.
2 Assistant Engineers, 2nd grade for six months - - - - -	4,800
4 Upper Subordinates of the rank of supervisor, 2nd grade for six months - - - - -	4,800
1 Sub-surveyor for six months - - - - -	240
Travelling allowance - - - - -	2,000
	11,840

Adding to this the salary of the extra upper subordinate for the 3rd Barrier survey, not as yet provided for, the total charge for the present year will amount to 13,500 rupees, to be provided out of the 20,000 rupees entered in the Budget Estimate for such purposes.

25. If the above arrangements should be approved by the Government, the following additional officers and subordinates would have to be appointed to this circle :—

- 2 Assistant Engineers, 2nd grade.
- 5 Upper Subordinates, of whom Mr. Ward would be one.
- 4 Lower Subordinates.

The whole of the subordinates must have a competent knowledge of surveying and levelling.

26. The estimates for three surveys herewith submitted amount as follows :—

	Rs.
3rd Barrier Survey - - - - -	6,211
Wurda " - - - - -	4,475
Wynegunga " - - - - -	2,236
Total - - - - -	12,922

Of this 2,500 rupees have already been expended; and of the remainder 2,500 rupees for the 3rd Barrier, 1,950 rupees for the Wurda, and 1,600 rupees for the Wynegunga, would be expended within the year, making the total charge to the allotment of the year 8,550 rupees. Nothing has been allowed for this in the Budget Estimate, but the amount is small, and might be taken from that entered in the estimate for works under 2,500 rupees.

27. In conclusion, I would beg again to draw the attention of the Chief Commissioner to the question of the defective water supply for irrigation in the Delta. I brought it forward in my report upon the Wynegunga, dated 14th December 1866; and again pointedly drew attention to it in my No. 502, dated 13th April 1867, begging only that an inquiry into the facts of the case might be instituted. So far as I am informed, no action has yet been taken in the matter. I am not even aware whether the second letter above quoted has been received. I beg earnestly to represent that there can be no reason for postponing such inquiry. It involves questions of great importance; it will not require that any official, who may take a part in it, should be moved from his present post, and it will not cost the Government a single rupee. I would further beg respectfully to adduce this as an instance of the protracted and altogether incalculable delays which beset almost every undertaking in this country. The past history of these works, since their transfer to the central provinces took place, involving the reference of all important questions to Calcutta or the Himalayas, is full of them, and I would urge that this is an additional reason for pushing forward such preliminary investigations as those which it has been the object of this letter to advocate with vigour. We may be quite sure that the information so obtained will not reach us a bit too soon, and will itself furnish fresh reasons for still more of the endless discussions and delays through which every project not of the most routine description must work its slow and tedious way to actual execution.

No. 846, dated 22nd July 1867.

From Major *F. T. Haig*, Superintending Engineer, Upper Godavery Circle, to Secretary to Chief Commissioner of Central Provinces, in the Public Works Department.

I REGRET to observe that in my No. 844, dated 20th instant, I have omitted all reference to the roads for which the Government of India has ordered that surveys should be made; I would now, therefore, submit, in continuation of that letter, some remarks and proposals upon the subject. The Government desire that estimates shall be prepared for the construction of "fair weather roads by both the routes discussed," viz., from Chanda, *viâ* Salagaum, to Neagellee at foot of 3rd Barrier, and from Chanda, *viâ* Sirpoor and Bibra, Sironcha.

to Sironcha. The one road would be 64 miles in length, and the other 150. I have no preference in favour of either route, but must equally condemn and repudiate both as substitutes for the navigation, but I wish heartily to carry out the orders of Government respecting them.

2. Regarding the first route then, viz., that *viâ* Salagaum to the foot of 3rd Barrier, I would repeat the request made in para. 6 of my No. 457, dated 28th March 1867, to which I have received no reply. A survey of that route was made by Lieutenant Montgomerie, Royal Engineers, in 1864-65, and I believe an estimate for a metalled and bridged road prepared. I recollect his sending me privately some information upon the subject, among other things, the total amount of the estimate. Now, I suppose, if such an estimate is in existence, it must furnish the means for framing another for a fair weather road only. I would be glad to be informed upon this point, and request that the estimate, if there is one, may be sent.

3. I should like also distinctly to understand what a fair weather road means. I suppose it is one without metal of any description or bridges, in fact the common native cart track slightly improved.

4. With regard to the other route from Chanda, *viâ* Sirpoor and Bibra to Sironcha, it will be necessary to appoint either an officer, or an experienced subordinate for the survey and selection of a line. A subordinate of some experience in road making, or rather in laying out roads, would probably do; an officer could hardly be made available for such a work. Probably the existing cart track might be generally followed.

It is not likely that a much better route could be found. The subordinate, say a sub-engineer, might be placed under the orders of Mr. Sieveking, from whom he would receive general instructions, but would have to determine and survey the line himself unassisted. The distance is not more than may easily be accomplished in the time.

5. If, therefore, as I suppose, the means already exist of estimating for the one route, I would propose that for the survey and estimate of the other, an addition be made to the 3rd Barrier survey party of an experienced subordinate, and would solicit sanction for the accompanying estimate, amounting to 955 rupees.

I have received Lieutenant Montgomerie's plans and level books of his survey, but not his estimate.

No. 686 C, dated 18th September 1867.

[No. 28.]—From Colonel *C. H. Dickens*, R.A., Secretary to Government of India, Public Works Department, to Chief Commissioner of Central Provinces.

I AM directed to acknowledge receipt of your secretary's letter, No. 277-3717 of 24th August 1867, forwarding copies of letters from Major Haig, giving an account of the survey operations of last season in connection with the 3rd Barrier Godavery Works, and submitting proposals for next season's operations.

2. In reply, I am directed to state that the orders of the Secretary of State must be awaited before any decision can be arrived at as to the proposed extension of operations in connection with these works.

3. Whilst admitting the importance of the survey of the Wynegunga and Wurda rivers, the Governor General in Council regrets his inability to augment the present surveying staff as required by Major Haig. He should, therefore, exercise his discretion, as fit men become liberated from the 1st Barrier works, to employ them on these surveys, commencing, as he proposes, with the lower section of the Wynegunga, with respect to which, it is observed, you hope to be able to provide trained assistance to aid in the work of preliminary investigation.

4. I am to express the satisfaction of his Excellency in Council at the progress made in the surveys at the end of last season.

PUBLIC WORKS DEPARTMENT PROCEEDINGS, October 1867.

Civil Works Communications.

FEEDER ROADS to the GODAVERY.

(No. 320—4148, dated 19th September 1867.)

[No 1.]—From Major *C. Pollard*, R.E., Officiating Secretary to Chief Commissioner of Central Provinces, in the Public Works Department, to Secretary to Government of India, Public Works Department.

I AM desired by the Officiating Chief Commissioner to forward, for information of his Excellency the Governor General in Council, as likely to be of importance, the accompanying copy of a docket from the Secretary to Resident, Hyderabad, Public Works Department, together with copy of its enclosure, being extract from a note on the subject of the construction of certain feeders to the Godavery in the Nizam's Territory, by his Highness the Nizam's Minister.

No. 1507, dated 2nd September 1867.

[No. 2.]—Memorandum from Secretary to Resident, Hyderabad, in the Public Works Department, to Secretary to Chief Commissioner, Central Provinces, in the Public Works Department.

REFERRING to Major Haig's letter, No. 18, dated 5th January last, to the address of the Secretary to Chief Commissioner of Central Provinces, Public Works Department, regarding the construction of certain feeders to the Godavery in the Nizam's territory, has the honour to enclose for information, extract from a note on the subject, received from his Highness the Nizam's Minister.

EXTRACT of a Note from His Highness the Nizam's Minister, to the Resident, Hyderabad, dated 9th August 1867.

"I HAVE the pleasure to return Major Haig's letter and enclosures, with many thanks.

"I have read the letter over attentively, and the conclusion to which it leads me, I may candidly confess to you is that, before this Circular incurs any expense for new roads, as feeders to the Godavery, it would be well to be assured that the navigation of the Godavery is rendered practicable by the completion of the works now in progress. In the meanwhile, the funds that might be expended on such roads would be better laid out in the improvement of roads, as feeders to railways, and on work of irrigation, &c.

"As there appears, however, to be some trade between Warungul and Mungapeth, I have given orders that one of our engineers should inspect the road, and report upon the improvements required, as well as to furnish a report on the road between Warungul and Hyderabad by the old route, and also by connecting it with the Bounger-road.

"This is all which it appears to me is called for at present.

"As regards the road from Elgundel to Mahdeapoor, or rather to Kalaiswaram, about which there appears to be so much uncertainty, I think it need not be made a subject of consideration at present."

(No Orders.)

PUBLIC WORKS DEPARTMENT PROCEEDINGS, October 1867.

Civil Works Communications.

EXPLORATION of the GODAVERY RIVER within the NIZAM'S TERRITORY.

(No. 122, dated 14th September 1867.)

[No. 12.]—From Major *G. Price*, Secretary to Resident at Hyderabad, in the Public Works Department, to Secretary to Government of India, Public Works Department.

THE progress of the works for the navigation of the Upper Godavery, naturally causes attention to be attracted to the relations borne thereto by the Nizam's country.

2. The lines of several "feeder roads," as they are termed, that is, roads leading from the interior to navigable points on the river, have been already considered; and the Resident has good hope that, as soon as the navigation works shall really approach a tolerably certain stage of completion, the Nizam's government will be found willing to do what can be fairly expected of it in respect to the opening up of auxiliary land communication, though, of course, it can hardly undertake operations of any great cost or magnitude.

3. But there is another point of even greater interest and importance, and that is the ascertainment of the navigability, or otherwise, of the river within the Nizam's dominions before it joins the Pranheeta, near Sironcha, midway between what are known to the British Government as the 2nd and 3rd Barriers.

4. There are records of explorations made by Major Haig, up the Godavery, above its junction with the Pranheeta, within the country of the Nizam. But these explorations have necessarily extended only over a short distance, and there remain long sections and sketches of the river in this quarter comparatively unexplored.

5. It would be manifestly desirable to examine further this section of the Upper Godavery, even in reference to the interests of the navigation works undertaken by the British Government lower down the river, besides the interests of the Nizam's territories adjoining.

6. The

6. The Nizam's government would be prepared to defray the moderate cost of such exploration, which would consist of the pay of the officer who might be employed on this duty, which would last some two months or so, provided such cost should not exceed 10,000 rupees in the aggregate. If the inquiry should show that no large section of the river could be rendered navigable at any reasonable cost, even then this negative information would be useful, and doubts would be set at rest. If it showed that the object could be obtained, though at a heavy cost, the fact would be interesting, although the Nizam's government is not likely to be in a position to undertake any such work; and although there would be still less any chance of a public or private company engaging in such an enterprise. But it showed that at a slight expense, like that of blasting some rocks, or clearing obstacles here and there, some navigable sections of the upper river might be brought into connection with the greater British navigation works below; then, indeed, the fact would be of some practical importance to the Nizam's government, inasmuch as that Government might be able to manage some such small works as those above mentioned.

7. The Resident would desire to know how far the above view meets with the approval of the Government of India; and whether he is authorised to place himself in communication with the Chief Commissioner of the Central Provinces, in order to obtain temporarily, for the short period above described, the services of some officer on whose report the engineer authorities connected with the Godavery would have confidence.

8. I am to add that the general tenor of this Despatch has the concurrence of his Highness the Nizam's Minister.

(No. 726c, dated 4th October 1867.)

No. 13.—From Colonel *C. H. Dickens*, R.A., Secretary to Government of India, Public Works Department, to Resident at Hyderabad.

In reply to your secretary's letter, No. 122, dated 14th September 1867, regarding the proposed exploration of the Godavery River within the Nizam's dominions, I am directed to state that there is no objection to your addressing the Chief Commissioner of the Central Provinces with the view of obtaining the services of a qualified officer for the duty, but there is very little likelihood of his being able to spare an officer at present, as the staff at his disposal is too weak to take up the survey of the Wurda and Wynegunga Rivers, and the Government of India has very recently intimated its inability to strengthen the staff of surveyors.

2. I am to add that the object has the approval of the Governor General in Council, and will be kept in view.

— No. 25. —

PUBLIC WORKS DESPATCH from the Secretary of State to the Government of India, No. 18, dated 29th February 1868.

Para. 1. I HAVE had before me in Council your Excellency's Despatch, No. 196, of 29th November last, replying to mine of 14th September previous, on the subject of the Godavery Navigation Works.

2. In your second para. you state, with reference to the preference expressed by me for the long over the short canal at the first barrier, that the latter was almost finished so long ago as March last, and that no difficulty was anticipated in blasting the rocks. Under these circumstances, I do not desire that the longer canal should be undertaken at present.

3. With regard, however, to the prosecution of the surveys above the third barrier, I cannot consent that these investigations should, as you propose, be delayed until the works at the second barrier are completed. With reference more especially to the storage of water in reservoirs, which I look upon as a most important element of success in the project, I am desirous that the surveys in question should be undertaken at an early period. I request, therefore, that the instructions conveyed in the 7th and 8th paras. of my Despatch, No. 86, of 14th September last, may not be overlooked.

(signed) *Stafford H. Northcote.*

—No. 26. —

(No. 200.—Public Works.—Government of India.—Public Works Department.)

To the Right Honourable the Secretary of State for India.

Sir,

Fort William, 14 December 1867.

Civil Works—
Communications.

WE have the honour to acknowledge receipt of your Despatch, No. 109, dated 31st October last, on the subject of the investigation of the navigable capabilities of the Kanhan and Wynegunga Rivers, and the survey of sites for the formation of reservoirs within the basin of the Godavery River, and beg in reply to refer you to our Despatch of 29th November 1867, No. 196, conveying our views as to the manner in which the Godavery Navigation Works should be proceeded with.

We have, &c.
(signed) *John Lawrence.*
G. N. Taylor.
W. N. Massey.
H. M. Durand.
G. U. Yule.

— No. 27. —

(No. 204.—Public Works.—Government of India.—Public Works Department.)

To the Right Honourable the Secretary of State for India.

Sir,

Fort William, 20 December 1867.

Civil Works—
Communications.

WE have the honour to forward, for the information of Her Majesty's Government, copy of a report by Major Haig of the operations on the Godavery Navigation Works during the third quarter of the present year, and of the orders issued by us thereon.

We have, &c.
(signed) *John Lawrence.*
W. R. Mansfield.
G. N. Taylor.
W. N. Massey.
H. M. Durand.
G. U. Yule.

Enclosures in No. 27.

(No. 390—4930, dated 23rd November 1867.)

From Captain *J. H. Bedford*, R.E., for Secretary to Chief Commissioner of Central Provinces, in the Public Works Department, to Secretary to the Government of India, Public Works Department.

As the Officiating Chief Commissioner is aware of the interest which the Supreme Government takes in all the operations of the Godavery Navigation Works, I am desired to forward, for the perusal of his Excellency the Viceroy in Council, an interesting report by Major Haig on the work executed during the past quarter, and which appears to have been less than was anticipated, owing to the exceptionally heavy monsoon.

2. The past quarter has been marked by the death by drowning of Lieutenant Roberts, a casualty much to be regretted. His loss is felt on the works, as he had shown himself an officer of skill and energy, and a valuable public servant, in addition to which his philanthropic efforts in providing for the comfort and sanitary wants of the workpeople, personally endeared him to them, and tended much to counteract the dread of the sickness which has operated so detrimentally amongst the gangs.

The Officiating Chief Commissioner joins with Major Haig and the other officers employed on the Godavery in regretting the premature death of this excellent officer.

3. The trials of Ransome's artificial stone will, Mr. Morris hopes, prove successful. Major Haig states it is not economical; and it seems the sole object gained by its use is time.

If

If the gain in this respect is really advantageous, the experiment may, perhaps, be justifiable; but it appears to the Officiating Chief Commissioner that it would have been more advantageous to have tried it in a country where natural stone was not abundant, and a good quarry was a desideratum. A special report on this artificial stone has been called for, and will be submitted for the information of Government.

4. The works of the second Barrier have not made the progress anticipated, and Major Haig considers the last season as lost, as far as the construction of the anicut is concerned.

Major Haig's strong interest in the work, perhaps, made him too sanguine, for it appears to Mr. Morris that a successful commencement has been made, and that we could hardly have expected more than this in that little known and much dreaded locality.

5. The sanitary and abkaree arrangements, described at length in paras. 11, 12, and 13, of the report now submitted are interesting, and the results very satisfactory.

The Chief Commissioner begs to draw attention to it, as showing how thoroughly Major Haig enters into all matters bearing on, or conducive to, the progress of the main scheme, and how well he appreciates the secondary measures necessary to keep his gangs in good working order.

6. Under the heading, "Transport and Supply Division," Major Haig touches on the present state of disrepair and inefficiency of the Samulcotta Canal.

His account of the present difficulties of its navigation speaks for itself without comment; and the Chief Commissioner solicits that the Supreme Government will, if his Excellency in Council deem fit, invite the attention of the Madras Government to the condition of this canal, which occupies an important position in, and influence on, the navigation of the Upper Godavery.

(No. 3134, dated 1st November 1867.)

From Major *F. T. Haig*, R.E., Superintending Engineer, Upper Godavery Circle, to Secretary to Chief Commissioner of the Central Provinces, in the Public Works Department.

I REGRET that, from various causes, I have been prevented from submitting at an earlier date a report upon the progress of the navigation works in this circle during the last quarter. I wish to continue these reports quarterly, not necessarily for submission to the Government of India, as they may not always be of sufficient interest for that purpose, but to keep the Chief Commissioner informed of our progress, respecting which the ordinary monthly "Progress Report" really affords very little information to any one who cannot find time or patience for a laborious comparison of its details with the estimates.

2. My last report embraced the half year ending 30th June, when the working season had closed. The quarter, whose operations I propose now briefly to review, comprises three of the monsoon months, when operations are necessarily much restricted, and when there cannot be much to record. The season has been one of the most rainy on record, and all out-door work has, from this cause, been even more than ordinarily hindered. The same cause has, I have no doubt, tended to increase the sickness at the second Barrier, which has been serious, and operated as a decided check to the progress of the works.

3. The operations of the quarter may be reviewed under the following heads:—

First Barrier Division.

Second Barrier Division.

Transport and Supply Division.

4. Before, however, describing these in detail, I must briefly advert to the melancholy event which has cast a gloom over the whole of the community connected with the works upon the Godavery, and which has deprived the State of the services of an able and valuable officer. I refer to the death by drowning of Lieutenant Roberts, R.E., Executive Engineer of the second Barrier Division, which occurred on the 17th September, and the particulars of which have been fully reported. He has passed from amongst us, sincerely lamented by Natives as well as Europeans, endeared to the former by his uniformly courteous and conciliatory manners, the genuine expression of a true and deep interest in their welfare, and leaving behind him the reputation of a gallant, high-minded, and public spirited officer. I cannot adequately supply his place. I proceed now to notice each division of the works in detail.

FIRST BARRIER DIVISION.

5. The operations in this division have been chiefly confined to the earthwork in the river embankments, in the excavation for the tail-locks at Gungole, and in the regulating tank on the drainage, which there crosses the canal. These works have given employment to the great bulk of the labourers, who, it is satisfactory to state, have now become

so habituated to contract work, that even those who were employed as daily labourers during the working season have taken willingly to earth-work at the prevailing contract rates.

The other works which have been in progress have been—

1st.—*The Head-Lock.*

When I closed my last report, the upper gates and one leaf of the lower of this lock were hung, and the masonry was not quite completed. Rapid progress was, however, made in July, and the whole is now complete.

In August, when the river rose to such a height as to stand back up the canal from its lower end to a depth sufficient for navigation, the whole of the boats, with stores to the amount of some 400 tons for the second Barrier works, and three of the small steamers, were passed through the canal and lock, the first instalment of the traffic which is yet to pass by the same route, the once formidable first Barrier. The gates of the lock, though not quite complete in some of their minor fittings, work satisfactorily.

2nd.—*Tail-Locks.*

The excavation for the upper lock of this pair was pushed forward and completed in time to lay a small portion of the masonry of the floor; but in August the river rose high enough to breach the bank, which shut it out at the lower end of the pit, and flooded the whole, putting an end to all building until the final subsidence of the floods. At the time that I write, the water has fallen low enough to admit of baling and clearing in the excavation, and the Executive Engineer expects to begin building on the 1st November.

The preparation of the cut stone for the sills, quoins, arches, and inverts of the side culverts has, meantime, been carried on, affording employment to the masons; and some experiments have been made in the manufacture of artificial stone by Ransome's process, the materials for which, sufficient for a considerable quantity of stone, have been received from England. The result is, that we find that we can make excellent stone by this process, but that the cost is likely to be considerably higher than I had anticipated. The principal advantage sought to be derived from this substitution of artificial for natural stone was, however, not cheapness, but the saving of labour which is effected wherever an article made, or partly made in England, or elsewhere, can be supplied in lieu of one made upon the spot. The want of labour, the difficulty of collecting it in sufficient quantity, and of retaining it, being the great difficulty which we have to contend with upon this river; every substitute which machinery, steam, or art can afford is a great gain, and in this way I have no doubt that we shall derive valuable assistance from the use of the patent stone. The rains have, however, greatly prevented the extension of the manufacture upon any considerable scale, and a more detailed account of the results will belong more properly to my next quarterly report.

Building materials of all kinds have been collected, and are, to a great extent, ready for the commencement of constructive operations as soon as the state of the river permits it.

3rd.—*Regulating Tank near the Tail-Locks.*

The precise object of this tank, which is, in general terms, to control the waters of a small stream which crosses the canal, and to obviate the necessity for an expensive culvert under the canal, will be described more particularly hereafter. A considerable amount of the earthwork is finished, as well as the masonry of the surplus weir, and a part of that of the sluice. The tank, in addition to its more immediate object, will afford irrigation to a small extent of land in Dumagudiem and its neighbourhood.

6. The repairs of the station roads, and of the coolies' lines, and the usual workshop operations, which continue as before, make up the total of the works in progress in this division during the quarter.

SECOND BARRIER DIVISION.

7. At the date of my last quarterly report, 3rd July, there were 500 workpeople employed at the second Barrier. The operations up to that time, from the date of commencement in March, had been of a preparatory nature, consisting of clearing jungle, drainage, and housing the workpeople and establishments. They have been chiefly of the same kind during the quarter under review, the available labour admitting of little being done in the quarry and in the preparation of materials. The number of workpeople gradually rose from 500 in the month of June to 1,200 in the middle of August. It then declined to 800 in the beginning of September, and amounted to 700 only at the close of the quarter. It is now 1,050, and steadily but slowly increasing. These numbers are far below what I hoped we should have had, but for the reasons which I shall presently give quite as great as it was desirable under the circumstances to employ.

The late date at which sanction for the works was received (only three months before the close of the working season) operated in three ways to check progress. It prevented the

the collection of labour in sufficient quantities during the hot season to clear the jungle and drain the station properly, without which no mitigation of the fever can be hoped for; it rendered it impossible to collect a sufficiency of thatching materials, almost all of the grass in the jungles having been burnt up by that time, and it deprived us of a large amount of labour in consequence of the labouring classes in the surrounding talooks, who, had they known in time, and believed that the works were really to be carried on without check, would have come, having made their arrangements and entered into engagements to cultivate during the present season. In ordinary times these people support themselves by cultivation, but they are always ready to abandon it for employment on the Government works, which pays them better; if only they have confidence the works will continue for any length of time. Unfortunately the repeated stoppages of operations in former years have greatly shaken this confidence, and for the present year numbers who formerly were employed on the tramroad, when that was under construction, are engaged in cultivation, which they will not be able to leave for another two or three months.

8. From these causes it happened that after the rains had set in, the numbers present on the works were far in excess of the available accommodation, though every effort was made to erect houses as fast as possible, and the effects of the unhealthy climate were thus aggravated by want of proper shelter. The result soon showed itself in the increasing sick list, and the falling off in numbers, which, as above stated, declined from 1,200 to 700 during the quarter. In the beginning of July, with a working strength of 600, the number of sick was only eight. In the end of September, with a working strength of 750, the sick list amounted to 96. It was evident, under these circumstances, that an increase of numbers would be an evil, and not a gain. Early in the quarter, therefore, all recruiting operations were stopped, and those only received who came of their own accord, and who could not well be sent away again. All available labour was employed in the erection of proper houses for the workpeople, to the extent which the limited supply of thatching material admitted of, and every precaution was taken to protect the people as much as possible from the effects of the climate. Nevertheless a portion of the 700 who remained at the close of the rains were still inadequately sheltered, and it is only since the fine weather set in that our numbers have begun again to increase.

9. The effect of all these causes combined has been that the progress made with the works has fallen far short of what it might have been had sanction been accorded two or three months earlier. In point of fact, the last working season was lost, and the three years in which I reckoned that the works might be completed ought to be reckoned from a later date. I do not doubt that there was sufficient cause for the delay in the sanction of the works. I do not mean to question this, but I mention it as undoubtedly the main reason for the comparatively small progress made hitherto. At present we have good houses for two officers, five subordinates, the greater part of the office establishment, and about 1,000 workpeople. The smith's shop, carpenter's shop, fitter's shop, divisional store, and provision store, are in various stages of progress, mostly roofed in, and walls partly raised. Houses for another officer, for the apothecary, and another subordinate, are well advanced, and the construction of additional coolie lines keeps pace with the gradual increase of numbers, the supply of thatching grass being now plentiful. The station road connecting the lines at Enchampilly with those at Neelumpilly, the site of the works, a mile distant, is in progress, and completed for half its intended width to the formation level for half its length. At the lime-kilns the operations have been confined to the preparation of lime sufficient only for the buildings under construction, but are capable of immediate expansion as soon as the works in the river bed can be commenced. The quarry has been opened out at one point, and the quantity of rock is found to be far in excess of what I had supposed, the thickness of the stratum being not less than 80 feet thick. No portion of the railroads has yet been laid, but the rails, waggons, cranes, and quarry plant generally have arrived, and are now in boats anchored off Enchampilly, until the fall of the river admits of their being hauled up to the proper point for unloading. An abundant supply of blasting powder has reached Cocanada, and is in part on the way up. The supply of fuze from England has unfortunately been delayed, but is now on the way, and meantime enough to begin with has been procured in this country.

10. Thus, though the progress made has been slow, it has, I am satisfied, been quite as great as was practicable under the circumstances, and, on the whole, we are in a better state of preparation for the working season, which may now be said to have commenced, than could have been expected. I would, however, offer no estimate at present of the probable date of completion. A year must elapse before we can speak with any confidence about that.

11. With regard to the sickness which has prevailed during the rains, although it has been serious it affords no cause for despondency. The worst of it is over, and as regards the fever, experience at the second Barrier is the same with that at the first, in respect of the comparatively mild type of the disease. Out of 867 admissions to hospital during the past quarter, there were but four deaths, two of which were from snake bites, and two from dysentery. Not a single fatal case of fever occurred. It is only when the disease has been neglected for some days, in consequence of patients refusing to come for treatment, that fatal effects follow. On an average, it is found that 20 to 24 grains of quinine are sufficient to cure an attack of fever, and whenever the cases are received in time, this

result is almost invariable. With regard to the prevalence of the disease, it is satisfactory to report that, contrary to expectation, the cessation of the rains, and the bright hot days which have followed in October, have not been accompanied by an increase, but, on the contrary, a marked decrease, in the number of fever cases. In the first week of October, with a working strength of 850, the total number of cases on the sick list averaged 110, of which 71 or 8·4 per cent. of the working strength were fever. In the last week, with a working total of 1,020, the total of the sick list averaged 84, of whom 55 were fever cases, or 5·4 per cent. only of the working strength. The proportion of the total number of sick to working strength for the same periods, was 13 and 8·2 per cent. respectively. It will be observed that the per-centage is here calculated upon the number actually available for work, but the sick list really includes some who do not work, and a slight reduction in the per-centages might be made on this account.

12. The above figures show that the fever, even under the most unfavourable conditions, is not really very severe; yet its effects in discrediting and keeping back labour from the works is much greater than these figures indicate, for with every care it is not possible to prevent some of the coolies, when attacked, either hiding, in order to avoid treatment, until too late, or running away as soon as attacked, and either dying on the road home, or spreading terror by their exaggerated reports of the sickness in all directions. However, in this respect also I have no doubt the worst has passed, for after a very little experience of its effects, quinine becomes so prized and coveted, that not only do the people come more willingly for treatment, but the greatest care has to be exercised to prevent the drug being stolen. The wealthier natives purchase it at high prices on their own account.

13. It is a curious exemplification of the effect of clearing and draining on the most unhealthy spots, that the number of sick at Dumagudiem during the past quarter has been only one per cent. of the population, while in this newly opened and only partially cleared station it has been as high as 13.

14. I am inclined to think that the marked reduction in the per-centage of sick at the second Barrier during the past month, at the very time when we usually look for an increase, has been in part owing to some preventative measures which have been introduced. The people are now not summoned to work until half an hour after sunrise, and dismissed half an hour before sunset. This prevents exposure to the early morning and night air, when the atmosphere is most impregnated with malaria. An allowance of hot rice-conjee is also served out to the different gangs while at work; the rice and a little salt only being supplied them, and they making their own arrangements for fuel and cooking. This tends to prevent the exhaustion which some hours work, especially in the forenoon, must cause in enfeebled constitutions, and when, as is often the case, a man comes to work without having taken a proper meal, and the liability to fever must thereby be diminished. I have also succeeded in placing the sale of liquor under proper control, the contractor only being allowed to sell at certain hours in the lines a fixed quantity of arrack, which is determined from week to week by a careful calculation of the number of people and the proportion of those who drink. The latter are allowed one-fifth of a seer per man per day, and one-tenth per woman. The system works well, and I cannot doubt has most beneficial effects, for the drunkenness before, especially among the Hyderabad men, was very great, and the liability to fever, and its effects upon the debilitated victims of this vice, must have been proportionately great. I only wish it were possible to check the consumption of spirits by Europeans by some simple process, and so prevent that demoralization of the subordinate establishment which, I fear, is much more extensive than is generally known.

15. I pass on to notice briefly the operations of the

TRANSPORT AND SUPPLY DIVISION.

These have consisted in the receipt and dispatch of stores to the first and second Barriers. About 600 tons of stores from England had to be sent up from Cocanada to the second Barrier; and it is satisfactory that, in spite of many delays and hindrances, with but one effective steamer to do this, besides all the other carrying work required, 400 tons have reached their destination. The most serious delays were met with on a part of the line of navigation where they would have been least expected, viz., on the canal connecting the port of Cocanada with the river at Dowlaishwarum. There are two canals; but the locks on one of them are not quite large enough for our barges, and we have been accustomed to use the other, known as the Samulcotta Canal, which is furnished with locks of ample dimensions, and used to be always regarded as a principal if not the main line of communication with the port. This canal, unfortunately, has fallen into such a state of disrepair or inefficiency, that some of our boats actually took 30 to 40 days to make the passage to Dowlaishwarum, the distance being 32 miles. The shoals in this canal are much more formidable than those in the river. Mr. Dennison, the superintendent, Transport and Supply Division, struck on one in his little paddle-boat, drawing 16 inches, in August, and only got off by taking everything out, and dragging the boat over with such force as to open her seams. He succeeded in getting one of our barges off a shoal by damming the canal with some boards immediately behind her, and so raising the water and floating her off. These are singular manœuvres in the main navigation canal, connecting all this part of India with the port.

Some

Some boats stuck so fast and so hopelessly, that the only way to get them up was to lighten them, by shifting a part of their cargo into other boats (no easy operation with boats laden with heavy pieces of machinery), and to send them up the other canal, cutting the corners off their square bows, to allow them to pass through the locks.

One ceases to wonder at anything in India, or this specimen of a first-class navigation canal in the year 1867 might excite some surprise. I am satisfied, however, that no blame is attributable to the very active executive engineer of the range in which this canal lies, but that its present deplorable condition is simply owing to want of funds to keep it in proper repair, and to enlarge it sufficiently to enable it to deliver the large body of water which it has to supply for the irrigation of the lands along its course without reducing the depth at its lower end to an extent incompatible with navigation. I believe that it is to be enlarged this year, but it is most desirable that the attention of the Madras Government should be drawn to the subject, for unless this canal or the alternative one be kept in proper working order, it will be in vain to spend large sums of money upon the navigation of the Godavery.

16. It may be worth mentioning that our only effective steamer, the "Prince," met with an accident during the past quarter which might have had very serious results. She had towed up the stores for the second Barrier to Dumagudiem; the boats containing them had been passed through the canal, and the steamer had then to run over the anicut, in order to take them on to Enchampilly. The water was not quite high enough at the time the attempt was made; but as the river was falling, and there was not a day to lose, Captain Barber, on the 26th August, endeavoured to make the passage. About 100 yards below the anicut the steamer, which could scarcely stem the current, swung round, dropped slightly down stream broadside on, and struck a rock which ripped her bottom right across from bilge to bilge immediately under the engines. The force of the shock had slightly bent the connecting rods, so that when the order to go ahead half-steam was given the engine refused to move.

Meantime the water was pouring in through the rent, and a very few minutes was all the time the steamer could hope to keep above water. The engineer, however, turned on the steam at full pressure, and the sudden jerk started the engines. The steamer's head swung round just in time, and the captain ran her full speed on the shore, which she just reached, and sank immediately. The water, however, fell fast, and in a day or two was low enough to enable workmen to get at her bottom inside. The rent was patched up on the rag and daub system commonly in use on this river; the steamer floated, and on 3rd September, the river rising high enough, she passed the anicut and towed all the stores up to Enchampilly.

She is now laid up for repairs.

Of course this is the sort of accident that would never happen once the first Barrier works are completed. No steamer then will have to cross the anicut, or to go anywhere near the rocks; but during the progress of the works such accidents are unavoidable, and have frequently occurred, though, providentially, never once attended with loss of life.

17. The first of the new steamers and six of the new barges were landed at Cocanada in June, and have since been brought up to Dowlaishwarum, where four of the barges are to be put together. The other two with the steamer are on their way to Gollagudiem, the lower end of the long canal, first Barrier, where it is intended to construct them.

The other two steamers are on their way out.

18. The health of the establishments generally during the quarter was good, excepting at the second Barrier, where all the Europeans suffered more or less from fever.

19. The only other subject that it appears necessary to mention is, that the subject of feeder roads was brought before the Nizam's Government by the Resident during the quarter.

The Minister's reply indicates little interest in the subject, and gives small hopes that any effective measures for the construction of such roads will be taken.

(No. 872 C.—Government of India.—Public Works Department.)

To the Chief Commissioner of the Central Provinces, in the Public Works Department.

Sir,

Fort William, 20 December 1867.

I AM directed to acknowledge receipt of your Secretary's letter (No 390—4930) of 23rd November 1867, forwarding a report by Major Haig of the operations on the Godavery Navigation Works during the third quarter of the present year. Civil Works—
Communications.

2. The Government of Madras will be addressed on the subject of the Samulcotta Canal.

3. The Governor General in Council has read with satisfaction the report of the sanitary arrangements made by Major Haig in connection with the second Barrier works. The results appear to have been very satisfactory, and I am to request that the commendation of the Government of India may be conveyed to Major Haig.

4. His Excellency in Council joins with you in regretting the premature death of Lieutenant Roberts, who is reported to have been a promising and energetic young officer.

5. A copy of the report will be forwarded to the Secretary of State.

I have, &c.
(signed) *C. H. Dickens*, Colonel, R. A.,
Secretary to the Government of India.

(No. 873 C.—Government of India.—Public Works Department.)

To the Secretary to the Government of Madras, in the Public Works Department.

Sir,

Fort William, 20 December 1867.

Civil Works—
Communications.

I AM directed by the Governor General in Council to enclose, for such action as may appear desirable to the Government of Madras, an extract from a recent report by Major Haig, the Superintending Engineer of the Upper Godavery Works, on the present condition of the Samulcotta Canal. His Excellency in Council will be glad to be informed what improvements are found to be necessary, and what are ordered to be put in hand.

I have, &c.
(signed) *C. H. Dickens*, Colonel, R. A.,
Secretary to the Government of India.

— No. 28. —

PUBLIC WORKS DESPATCH from the Secretary of State to the Government of India (No. 19) ; dated 29th February 1868.

Para. 1. I HAVE received your Excellency's Despatch, No. 204, of 20th December last, with the enclosed report by Major Haig, describing the operations connected with the Godavery Navigation Works during the third quarter of 1867.

2. During the period under review little appears to have been accomplished ; but the small progress has apparently been the result of circumstances for which officers in charge of the works cannot be held responsible.

3. The present condition of the Samulcotta Canal, on which Major Haig has very properly remarked, is certainly very discreditable, and I am glad to see that the attention of the Madras Government has been drawn by you to the subject. I request to be furnished with a copy of the observations they may make in reply.

4. I notice with regret what is said of the disinclination on the part of the Nizam's Government to take active steps towards the construction of feeders to the Godavery.

5. I participate in your regret at the premature death of Lieut. Roberts, R. E., of whose public and private character I observe that Major Haig speaks in the highest terms.

I have, &c.
(signed) *Stafford H. Northcote*.

-- No. 29. --

(No. 19.—Public Works.—Government of India.—Public Works Department.)

To the Right Honourable the Secretary of State for India.

Sir,

Fort William, 4 February 1868.

Civil Works—
Communications.

IN continuation of our letter, No. 137, dated 17th August 1867, we have the honour to forward, for the information of Her Majesty's Government, the Progress Reports of the first and second Barrier Divisions, and of the Transport and Supply Divisions, of the Upper Godavery Works, for the half-year ending 30th September 1867, together with copies of our letters to the Chief Commissioner of the Central Provinces on the subject.

We have, &c.

(signed)

John Lawrence.
W. R. Mansfield.
G. N. Taylor.
W. N. Massey.
H. M. Durand.
H. S. Maine.
W. Muir.

Enclosures in No. 29.

(No. 399—89, dated 7th January 1868.)

[No. 1.]—From Major *C. Pollard*, R.E., Secretary to the Chief Commissioner of the Central Provinces, in the Public Works Department, to the Secretary Government of India, Public Works Department.

IN submitting, for information of the Government of India, the Progress Report of the first Barrier Division, Upper Godavery Works, for the half-year ending 30th September 1867, I am desired by the Chief Commissioner to point out the high rates at which work is proceeding, which far exceed those provided for in the estimates. The Chief Commissioner invites attention to this, as it was one of the points adverted to by the committee, Colonels Anderson and Fife, who differed from Major Haig's estimate of the probable cost of work on the Godavery.

STATEMENT showing Progress and Cost of WORKS in UPPER GODAVERY.

NAME OF WORKS.	Quantities.			Per-centage of Work done.		Cost.		
	As in Estimate.	Done during Half-year.	Total done up to 30 Sept. 1867.	During Half-year	From 30 April 1863, up to 30 Sept. 1867.	As in Estimate.	Actual of Work done during Half-year.	Actual to 30 Sept. 1867.
1. Anicut—Masonry - -	782,675	73,936	533,422	9.45	68.15	Rs. 2,20,914	Rs. 23,297	Rs. 1,46,263
2. Sluice-wall—ditto - -	200,185	-	184,527	-	92.17	71,430	1,923	80,75
3. Head Lock—ditto - -	256,962	4,956	260,032	1.92	101.19	88,457	13,576	1,21,231
4. 1st Section of Canal—Earth-work.	-	695,521	13,735,565	-	-	-	11,234	1,59,951
5. Flood embankment—Earth-work	-	875,695	5,868,488	-	-	-	5,028	40,511
6. Tail Lock—Masonry - -	314,180	11,985	11,985	3.81	3.81	Cost not yet taken out	17,622	17,622
7. Tank at Gangole — Earth-work.	857,426	314,268	314,268	36.65	36.65	-	3,437	3,437
8. Accommodation for Establishment.	-	-	-	-	-	-	2,049	-
9. Manufacture of, purchases, and repairs of stock.	-	-	-	-	-	-	9,727	-
10. Manufacture of, purchases, and repairs of tools and plant.	-	-	-	-	-	-	12,380	-
11. Repairs of tramway - -	-	-	-	-	-	1,643	1,007	-
12. Miscellaneous charges - -	-	-	-	-	-	-	H. 16,469	-
13. River improvements—Clearing rock - -	-	87,689	87,689	-	-	-	5,934	5,934
Station Improvements - -	-	-	-	-	-	Road - - 817 Clearing jungle, 382	1,191	-

ABSTRACT of first Seven Items in

Masonry - - - -	1,239,822*	78,892	977,981	6.36	78.88	Rs. 3,80,801*	Rs. 38,796	Rs. 3,48,251
Earth-work - - - -	-	1,855,484½	19,918,321½	-	-	-	19,699	2,03,900

Doomagoodiem, }
29 October 1867. }

I send this Statement on as it is, but have no confidence in the accuracy of the rates as here shown. The charges have not always been properly finished, rates can be accurately deduced.

(No. 422—113, dated 8th January 1868.)

[No. 2.]—From Major *C. Pollard*, R.E., Secretary to the Chief Commissioner of the Central Provinces, in the Public Works Department, to the Secretary to the Government of India Public Works, Department.

IN submitting to Government the Half-yearly Report of the Transport and Supply Division on the Godavery, I am directed to invite attention to the results which, in the present restricted traffic on the river, are not very encouraging.

The cost of the conveyance of stores during the half-year ending 30th September 1867 has been—

On 1st Reach, between Dowlaishwarum and foot of 1st Barrier, 2·1 anna per ton per mile.

On 2nd Reach, between 1st and 2nd Barrier, 3·4 annas per ton per mile.

Whilst on the tramway, the cost has reached 5·4 annas per ton.

2. All these rates, the Chief Commissioner observes, are high; and although the rates of a transport agency, organized for a special-purpose like that on the Godavery, cannot be made to contrast favourably with an agency established for commercial purposes, still there is sufficient difference between the rates of carriage in the 1st and 2nd Reaches to warrant the supposition that the rate of 3·4 annas per ton is susceptible of reduction, and the superintending engineer's attention will be called to this point.

3. The very high rate of the cost of transport by the tramway between Gollagudiem and Turbacca, which quite equals the cost by common country cart, can, Mr. Campbell thinks, only be accounted for by its bad state of repair. From the marginal note of the superintending engineer, it appears this tramway has been now given up, but Major Haig does not state whether this has been brought about by the necessity for the tramway no longer existing, or from the cost of the tramway having been found incommensurate with its advantages.

4. The proportionate per-centage of the cost of the Supply Department has, the Chief Commissioner regrets to say, largely increased, being 11·3 in the half year now under review, against 6·8 of the preceding half year, but he is not prepared on that account altogether to blame the management of the past half year, for it appears to him that much of this high per-centage is due to the diminished transactions of this branch, and consequent increase in the business of private traders, in fact, by the approach of the consummation of the end, which it is so desirable should be attained, namely, that these dealings should pass wholly into the hands of merchants and private dealers.

But whilst bringing about this result, the superintending engineer should be careful to keep all his establishments at a minimum, and reduce them in proportion to the diminished transaction of the Supply Department.

(No. 704, dated 14th November 1867.)

From *J. H. Dennison*, Esq., Officiating Superintendent, Transport and Supply Division, Upper Godavery Works, to Superintending Engineer, Upper Godavery Circle.

THE half-yearly report of operations of the Transport and Supply Division being due, I beg to submit it for the period ending 30th September 1867.

2. It will be unnecessary to repeat the nature of works comprised in this division, it being in every respect similar to what I had particularized in my previous reports.

3. A difference existing in the cost of permanent establishment this year, gives the following figures, chargeable to the Transport and Supply Branches respectively:—

	Permanent Establishment.	Transport.	Supply.
	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
1 Officiating Superintendent, for 6 months, at 450 rupees per month - - - - -	2,700	1,350	1,350
1 Commander, Flotilla, for six months, at 200 rupees per month - - - - -	1,200	1,200	—
1 Sub-Engineer, for April 1867 - - - - -	400	400	—
1 Overseer, for 6 months, at 180 rupees per month - - - - -	1,080	540	540
Office establishment for 6 months - - - - -	2,624	1,312	1,312
Travelling allowances - - - - -	912	456	456
Contingencies - - - - -	470	235	235
TOTAL - - - <i>Rs.</i>	9,386	5,493	3,893

4. The

4. The figures under the column of "Transport" are to be divided as follows:—

	Rs.
1st Reach.—River Transport - - - - -	2,746
2nd " " - - - - -	1,373
3rd.—Land Transport Tramway - - - - -	1,374

5. To arrive at the actual cost and carriage of all stores per ton per mile on the river, as well as the tramway, the cost of the permanent establishment is added respectively, though not chargeable as a rule to works.

6. The actual transactions of the Division are—

TRANSPORT.

7. As stated in my preceding reports, this branch consists of river and land transport; the former being divided into 1st and 2nd Reaches.

8. The flotilla engaged in the river transport consists of the following steamers and boats, viz., in 1st Reach, or between Dowlaishwarum and 1st Barrier, distance 96 miles:—

Steamer "Prince," up to 2nd September 1867.	
" " "Shamrock."	
" " "Arthur Cotton," from 21st July to 26th August, and from 19th September 1867.	
One boat ("Queen") of 50 tons.	
Two boats - - - of 70 "	
Three " - - - of 35 "	
Four flats - - - of 50 "	

All the above boats and flats were towed up as far as Enchampilly by the "Prince," now plying in 2nd Reach; the "Shamrock" working as usual between Dowlaishwarum and Burragula, distance 118 miles.

The "Trevalyn," last reported as about to be converted into a lighter, awaits the sanction of estimate submitted for that purpose.

9. In the 2nd Reach, between 1st and 2nd Barriers, distance 85 miles, are—

Steamer "Arthur Cotton," from 22nd June to 21st July, and from 27th August to 20th September 1867.	
Steamer "Rose."	
Two boats of 50 tons.	
One boat of 40 tons.	
Ten boats of 30 tons.	
The steamer "Hope" is under repair.	

10. In the 4th Reach, above 3rd Barrier, are the—

Steamer "May Flower."	
One boat of 30 tons.	

11. The steamers in 1st Reach have rendered similar service as heretofore: the "Prince" plying till 2nd September 1867 between Dowlaishwarum and Burragula, casting off flats and boats towed up at the tail-lock there, when the rising of the river was watched, and all the flats and boats passed through the canal into the 2nd Reach as opportunities occurred; after which she crossed the anicut to render similar services in the 2nd Reach. It was while attempting to cross the anicut that she met with an accident that injured her bottom, a rock cutting a large hole into her, which laid her up for a few days; but she was soon repaired, crossed the anicut, and resumed her work in the 2nd Reach.

12. The cargo conveyed up by her was composed of provisions, heavy machinery, brought by the "Dunphaile Castle" and "Brockham," material, stores, and treasure for 1st and 2nd Barriers, besides other departmental stores. The total quantity of stores conveyed up during the period embodied in this report is as follows:—

	Tons.
Total engineer's stores, carried up to one mile - -	70,247
Total divisional stores and provisions, carried up to one mile - - - - -	86,863
Other departmental and private stores - - -	1,444
TOTAL Tons carried to One Mile - -	158,556

Passengers the whole distance - - - - -	No. 546
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13. The total expenditure incurred in the above Reach for this half year is shown in the following figures :—

	Rs.
Permanent establishment - - - - -	2,746
Temporary - - - - -	886
Labour and material - - - - -	18,539
TOTAL - - - - -	Rs. 22,171

Income - - - - - Rs. 1,140

From the above amount, if the income derived on this Reach, amounting to 1,140 rupees, be deducted, the actual sum expended on the carriage of stores, provisions, &c., will show 21,031 rupees.

14. Comparing this half year, ending 30th September 1867, with the past, ending 31st March 1867, the cost of one ton per mile stands at 2·1 of an anna:—

	Total Tons carried One Mile.	Total Expenditure.	Rate per Ton per Mile.
		Rs.	As.
Half year ending 31st March 1867 - - - -	86,253	10,687	1·9
" " 30th September 1867 - - - -	157,110	21,031	2·1
Difference - - - -	70,857	10,344	·2

15. The steamer "Prince" having met with a mishap in getting aground above the gorge on the 24th August, and delayed for five days, as also having to cross the anicut, and get into 2nd Reach, to do the work there that the other steamers were unable to do, and the accident occurring to her, all combined, acted very detrimentally to the work that had to be done in the 1st Reach, as it was supposed that the "Prince" would have done the whole prior to proceeding over the anicut into the 2nd Reach; hence the increase on transport expenditure, as common hired boats had to be employed for conveying up stores, which, under other more favourable circumstances, the "Prince" would have undoubtedly towed up herself.

2nd Reach.

16. The steamers and boats in this reach had little work to do; but the "Prince" towed up during the high fresh all the stores passed through the canal from 1st into 2nd Reach brought by the "Dunphail Castle" and "Brockham," with other stores and provisions. The total quantity conveyed for the half year ending 30th September 1867 is as follows:—

	Tons.
Total engineer's stores, carried up to one mile - -	25,505
Total divisional " - -	80
Other departmental and private stores " - -	1,800
TOTAL Tons carried One Mile - -	27,385

Passengers - - - - - No. 240

While the expenditure incurred was as follows :—

	Rs.
Permanent establishment - - - - -	1,373
Temporary establishment - - - - -	659
Labour and material - - - - -	3,975
TOTAL - - - - -	Rs. 6,007

Income - - - - - Rs. 420

17. The expenditure on total tons carried, as shown above, gives a very high rate. I have no previous report to compare with this, as the only half-yearly report on record in

in this office (the other being sent to you, and not returned) is the one for the last half-year, when no work was done in the 2nd Reach, the steamers and boats lying in ordinary during the dry season. As far as my memory serves me, I think the rate shown was very favourable during the working season last year, and considerably lower than the previous year:—

	Total Tons carried to One Mile.	Total Expenditure.	Rate per Ton.
		<i>Rupees.</i>	<i>Annas.</i>
Half year ending 30th September 1867 - - -	25,585	5,587	3·4

18. The only reason I can assign for the high rate above shown is, that the “Rose” and the “Arthur Cotton,” for the short time the latter plied in the 2nd Reach, did little or no work, but merely plied between Dumagudiem and Enchampilly, carrying small quantities of stores on board; whereas, during previous years, they were actively employed in towing flats and boats laden with lime and cut stone from the Boomalunka and Moonoogoor quarries, which in this season could not be accomplished, as all the available boats in the 2nd Reach were passed down the canal in July into 1st Reach to receive cut stone from Goorgumpad; hence, while expenditure was incurring, the steamers were unable to do such work as would show a remuneration in striking rates. Independent of this, the succession of heavy freshes we have had was more than they could well contend against, and consequently long passages were made in this Reach, and delays occurring, all have acted detrimentally towards showing a fair rate. I may fairly state that the carriage shown in the 2nd Reach is what the “Prince” accomplished only in one month, during September, the “Rose” having done but little, and kept plying between Enchampilly and Dumagudium, carrying petty materials, workmen, and passengers for the convenience of the works going on in the former place.

This is the case. There was no work for these two small steamers at 1st Barrier, and the boats laden with stores for 2nd Barrier being larger than they could tow; the steamers did little besides keep up the communication between the Barriers, and carry a few passengers and small quantity of goods.—*F. Haig.*

19. The expenditure in the 4th Reach for protection of the steamer, “May Flower” and boat, during this half year, amounts to 166 rupees, being wages of crew. The steamer was kept ready for any emergency, but it appears was not called upon to do any work.

The “May Flower” was, however, employed for a few days by the Deputy Commissioner, Chanda, in an attempt to explore the Pyne Gunga.—*F. Haig.*

LAND TRANSPORT TRAMWAY.

20. The tramway, as hitherto reported upon, extending from Gollagudiem to Dumagudiem, with a relay station (Turbacca) intervening midway, has performed the same kind of work, consisting of carriage of engineer’s stores, machinery, divisional stores, provisions, other departmental stores, private stores, workpeople and private passengers.

21. The total amount of work in carriage for this season is as follows:—

	<i>Tons.</i>
Engineer’s stores, carried up to one mile - - -	4,240
Divisional stores, provisions, and supplies - - -	18,477
Private, and other stores - - -	887
TOTAL - - -	23,604
Passengers - - - - -	No. 122

22. The expenditure incurred for its maintenance during this period is as follows:—

	<i>Rs.</i>
Permanent establishment - - - - -	1,374
Temporary establishment - - - - -	522
Labour and material - - - - -	6,039
TOTAL - - - Rs.	7,935
Income - - - - -	- Rs. 215

The amount of income derived from private and other stores and passengers, viz., 215 rupees, if deducted from expenditure incurred for conveyance of 22,717 tons per mile, gives the rate of 5·4 annas per ton per mile.

23. This, in comparison with the operations of the preceding half-year, shows as follows:—

	Total Tons carried One Mile.	Total Expenditure.	Rate per Ton per Mile.
		<i>Rupees.</i>	<i>Annas.</i>
Half year ending 31st March 1867 - - -	19,459	6,049	4·9
„ „ 30th September 1867 - - -	22,717	7,720	5·4
DIFFERENCE - - -	3,258	1,671	·5

24. The above rate is high, and exceeds that of the former half-year, as will be observed from the above comparison, for which several reasons can be assigned:—

1stly.—That I saw the necessity of allowing an extra allowance of gram to the ponies, which from hard work were getting very low in condition, and to prevent their getting knocked up altogether.

2ndly.—That high rates were paid for horse-gram during the first portion of this half year.

3rdly.—That the Turbacca Vagoo Bridge having been carried away, and not rebuilt, the stores at this point have to be unladen from the waggons; and ferried over reladen in waggons, thereby causing additional expense; and

Lastly.—The bad state of the tramroad, between Gollagudiem and Turbacca, precluding the lading of the waggons to their usual weight.

The tramroad was almost unfit for use. It has now been abandoned.

F. HARG.

The above reasons assigned have been the cause of the increased rate, which cannot be attributed to want of supervision, or bad management on the part of myself or subordinates.

SUPPLY BRANCH.

25. In this branch the transactions for this period are as follows:—

	<i>Rs.</i>
Total purchases - - - - -	33,856
Total sales - - - - -	29,150
Total transfers - - - - -	5,830
TOTAL - - - <i>Rs.</i>	68,836
<i>Expenditure.</i>	
	<i>Rs.</i>
Permanent establishment - - - - -	3,893
Temporary establishment - - - - -	847
Labour and material - - - - -	3,097
Carriage - - - - -	7
TOTAL - - - <i>Rs.</i>	7,844

giving per-centage of *Rs.* 11·3, inclusive of permanent establishment, or *Rs.* 5·7 excluding it.

26. This, in comparison with the preceding year, shows the following result:—

	Sales and Purchases.	TOTAL Expenditure.	Permanent Establishment inclusive. Rate per Cent.	Permanent Establishment exclusive. Rate per Cent.
	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
Half-year ending 31st March 1867	1,23,873	8,506	6·8	4·4
„ „ 30th Sept. „	68,836	7,844	11·3	5·7
Difference - - - <i>Rs.</i>	55,037	662	4·5	1·3

27. I anticipated

27. I anticipated hopes of favourable results in this branch of the department during the past half-year, after the great reductions made in the petty establishment, and the encouragement given to private speculators; but, on the contrary, this scheme, instead of proving beneficial to the department, now appears to have helped in raising the percentage. Our small purchases, though effected at cheap rates, and the equally scanty sales and transfers, were not transactions large enough to compensate for expenditure which was heavy; and the concessions in money that had to be made to private speculators, operating under advance and contract with the department, and the reduction of the selling rate of rice, increasing commission to retail contractor, and our purchases besides being sold at reduced rates, will, I trust, sufficiently account for the increased percentage. You are, moreover, doubtless, aware that for days no sales were effected by the department when private speculators' rice was brought in; that sales were very scanty, when resumed; and that expenditure for establishment was incurred all the time, but no sales to compensate for it.

28. I have done my very utmost, and have devoted a good deal of my time, towards regulating this branch of the department, and have tried every contrivance that would conduce to its transactions being effected without loss to Government; but this I find impossible to effect, from the fact of our selling rates being under *bonâ fide* cost of supplies.

BRINJARRY RECOVERIES.

29. The outstanding advances of this division, known as "Brinjarries' debts," have not been collected with the same success as it was attended with during the past half-year, though the agent, Mr. M'Gregor, has done all he can for recovering as much as possible. The sum of Rs. 872. 13. 4. only has been recovered, at a trifling cost of Rs. 43. 10., or at five per cent. commission on the amount recovered. The season was also against Mr. M'Gregor's operations, as the Brinjarries only come about the Upper Godavery district and the locality of Dumagudiem during harvest time, bringing in grain for sale. It is to be hoped that larger recovery will be made next half-year; the undertaking is altogether a difficult task, owing to the roving nature of Brinjarries, and their whereabouts, consequently, difficult to find out.

No. 427-440; dated 24th January 1868.

[No. 3.]-From Major C. Pollard, R. E., Secretary to Chief Commissioner of Central Provinces, in the Public Works Department, to Secretary to Government of India, Public Works Department.

IN continuation of this office, No. 399-89, of 7th instant, I am desired by the Chief Commissioner to submit, for information of the Government of India, the Progress Report of the second Barrier Division, Upper Godavery Works, for the half-year ending 30th September 1867.

STATEMENT showing Progress and Cost of WORKS in UPPER GODAVERY CIRCLE, SECOND BARRIER DIVISION, during Half-year ending 30th September 1867.

NAME OF WORKS.	Quantities.			Per-centage of Work done.		Cost.		Per-centage of Cost of Work done.		Rates per 100 Cubic Feet.			Excess over or Saving on Estimated Rates per Cent.		REMARKS AND EXPLANATION.	
	As in Estimate.	Done during Half-year.	Total done up to 30th September 1867.	During Half-year.	From 30th April 1863, up to 30th September 1867.	As in Estimate.	Actual of Work done during Half-year.	Actual to 30th September 1867.	During Half-year.	To 30th September 1867.	As in Estimate.	Of Work done in Half-year.	Of Work done from 30th April to 30th September 1867.	During Half-year.		Up to 30th September 1867.
1. Anicut - - - - -	-	-	-	-	-	Rs. 6,77,251	Rs. 7,039	Rs. 7,039 A.	-	-	-	-	-	-	-	A.—Includes the expenditure for accommodation of workmen at Nelumpilly, and quarrying operations.
2. Locks - - - - -	-	-	-	-	-	1,78,021	1,033	1,033 B.	-	-	-	-	-	-	-	
3 A. Guard wall - - - - -	-	-	-	-	-	-	1,030	1,030	-	-	-	-	-	-	-	B.—Includes proportional amount of expenditure on accommodation for workmen at Enchampilly.
3 B. Sluice wall - - - - -	-	-	-	-	-	1,36,442	1,030	1,030	-	-	-	-	-	-	-	
3 C. Wing wall - - - - -	-	-	-	-	-	39,168	-	-	-	-	-	-	-	-	-	C.—This is the amount of an estimate submitted by the late Lieutenant Roberts for small stores; but the expenditure includes a large variety of miscellaneous articles, such as timber &c.
4. Clearing rock in navigable channel above and below anicut.	-	-	-	-	-	1,600	-	-	-	-	-	-	-	-	-	
5. Towing-path on left bank - - - - -	-	-	-	-	-	31,650	12,581	12,581	-	-	-	-	-	-	-	D.—The excess of expenditure over estimate is due to the freight paid for London stores.
6. Accommodation for establishment, workshop stores, and hospital buildings.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7. Station improvement - - - - -	-	-	-	-	-	16,000	3,508	3,508	-	-	-	-	-	-	-	E.—The repairs to all buildings, as well as new works at Seroncha, have been finished; but the final settlement of their payment was made to the contractor in the next half-year.
8. Contingencies - - - - -	-	-	-	-	-	54,007	478	478	-	-	-	-	-	-	-	
9. Manufacture and repairs of stock - - - - -	-	-	-	-	-	-	11,653	11,653 C.	-	-	-	-	-	-	-	* This item is here included to agree with the monthly progress reports; but it is objectionable, and has now been struck out of the monthly account. The amount will be distributed over the works to which it is chargeable, and will not appear in the future half-yearly report.
10. Purchase of stock - - - - -	-	-	-	-	-	2,504	23,564	23,564	-	-	-	-	-	-	-	
11. Manufacture and repairs of tools and plant.	-	-	-	-	-	5,170	3,014	3,014	-	-	-	-	-	-	-	* This item is here included to agree with the monthly progress reports; but it is objectionable, and has now been struck out of the monthly account. The amount will be distributed over the works to which it is chargeable, and will not appear in the future half-yearly report.
12. Purchases of tools and plant - - - - -	-	-	-	-	-	494	12,570	12,570 D.	-	-	-	-	-	-	-	
13. Annual repairs to Enchampilly buildings.	-	-	-	-	-	1,227	1,214	1,214	-	-	-	-	-	-	-	* This item is here included to agree with the monthly progress reports; but it is objectionable, and has now been struck out of the monthly account. The amount will be distributed over the works to which it is chargeable, and will not appear in the future half-yearly report.
14. Annual repairs to civil buildings at Seroncha.	-	-	-	-	-	505	393	393	-	-	-	-	-	-	-	
15. Annual repairs to military buildings at Seroncha.	-	-	-	-	-	238	158	158 E.	-	-	-	-	-	-	-	* This item is here included to agree with the monthly progress reports; but it is objectionable, and has now been struck out of the monthly account. The amount will be distributed over the works to which it is chargeable, and will not appear in the future half-yearly report.
16. Quarter guard at Seroncha - - - - -	-	-	-	-	-	648	690	690	-	-	-	-	-	-	-	
17. Double bell-of-arms at Seroncha - - - - -	-	-	-	-	-	672	698	698	-	-	-	-	-	-	-	* This item is here included to agree with the monthly progress reports; but it is objectionable, and has now been struck out of the monthly account. The amount will be distributed over the works to which it is chargeable, and will not appear in the future half-yearly report.
18. Pavement around the wells - - - - -	-	-	-	-	-	184	202	202	-	-	-	-	-	-	-	
19. Repairs to magazine - - - - -	-	-	-	-	-	23	12	12	-	-	-	-	-	-	-	* This item is here included to agree with the monthly progress reports; but it is objectionable, and has now been struck out of the monthly account. The amount will be distributed over the works to which it is chargeable, and will not appear in the future half-yearly report.
20. Miscellaneous charges to labour - - - - -	-	-	-	-	-	-	6,626	6,626*	-	-	-	-	-	-	-	
21. 3rd Barrier survey - - - - -	-	-	-	-	-	11,665	89	89	-	-	-	-	-	-	-	* This item is here included to agree with the monthly progress reports; but it is objectionable, and has now been struck out of the monthly account. The amount will be distributed over the works to which it is chargeable, and will not appear in the future half-yearly report.
TOTAL - - - - -	-	-	-	-	-	Rs. 11,45,804	88,612	88,612	-	-	-	-	-	-	-	

(No. 49 C, dated 28th January 1868.)

[No. 4.]-From Colonel *C. H. Dickens*, R. A., Secretary to Government of India, Public Works Department, to Chief Commissioner of Central Provinces.

I AM directed to acknowledge receipt of your Secretary's letters, Nos. 399-89 and 422-113, dated respectively 7th and 8th January 1868, submitting the Progress Reports of the Godavery Works, 1st Division, and of the Transport and Supply Divisions, for the half-year ending 30th September 1867.

2. With reference to your remarks regarding the high rates at which the work is proceeding, I am to state that the Governor General in Council awaits with interest the fresh classification of expenditure which is said to be under preparation, and which it is hoped will be submitted at an early date. Major Haig's attention should, meanwhile, be drawn to the necessity of keeping the expenditure on each class of work distinct in the accounts. It is observed that, in several instances, rates have been largely enhanced, because charges for other classes of work, which should have been kept distinct, have been mixed up with them.

3. As regards the working of the Transport Department, the Governor General in Council observes that the cost of conveyance of stores on the 2nd Reach, between the 1st and 2nd Barriers appears to have been unduly enhanced by the employment of steamers such small size and power as the "Rose" and the "Arthur Cotton." The use of these vessels should be discouraged, and efforts should be made to utilise, as quickly as possible, the new steamers and barges lately sent out from England. When these latter are fairly at work, it will be a matter for consideration whether the two steamers above named should not be sold, unless they are required for surveying purposes. A report on this point should be submitted.

4. The tramway should, under the circumstances reported, be abandoned and broken up, and his Excellency in Council desires that this may now be done, and the materials comprising it sold, or utilized elsewhere, to the best advantage.

5. As regards the Supply Department, I am to remark that it appears that a traffic in grain is gradually springing up, which would doubtless increase if Government withdrew from competition with the regular traders. The time would, therefore, appear to have arrived when the transactions of this department may be brought gradually to a close, and steps towards this should accordingly be taken whenever you consider that this may be done without interfering with the progress of the work.

6. Lastly, I am to request that an early and full report may be submitted with regard to the nature and extent of the advances made to Brinjarries.

7. The Governor General in Council considers that the progress made during the half-year under review is, on the whole, satisfactory. The commendations of the Government have already been conveyed to Major Haig in reviewing his special report for the third quarter of 1867. *Vide Public Works Department Letter, No. 872 c, dated 20 December 1867.*

8. I am to request that, in future, these special reports may be sent up along with the ordinary half-yearly ones.

(No. 65 C, dated 4th February 1868.)

[No. 5.]-From Colonel *C. H. Dickens*, R. A., Secretary to Government of India, Public Works Department, to Chief Commissioner of Central Provinces.

WITH reference to your Secretary's letter, No. 427/440, dated 24th January 1868, I am directed to acknowledge receipt of the Progress Report of the 2nd Barrier Division, Upper Godavery Works, therewith submitted, but I am to state that it is inconvenient to receive the reports of these works in instalments, as has been done in the case of those for the half-year ending 30th September 1867, and to request that in future they may be received and submitted together.

EAST INDIA (LIEUTENANT GREY).

RETURN to an Address of the Honourable The House of Commons,
dated 8 May 1868;—for,

“COPY of DESPATCHES from the Government of *India* in Political Department,
dated the 7th day of December 1867 (No. 175), and in March 1868 (No. 36),
with Enclosures, relative to the SEIZURE of Lieutenant *Grey* by *Kowra Khan*,
a Belooch Chief.”

India Office, }
18 May 1868. }

J. W. KAYE, Secretary,
Political Department.

(*Sir Stafford Northcote.*)

Ordered, by The House of Commons, to be Printed,
19 May 1868.

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COPY of DESPATCHES from the Government of *India* in Political Department, dated the 7th day of December 1867 (No. 175), and in March 1868 (No 36), with Enclosures, relative to the SEIZURE of Lieutenant *Grey* by *Kowra Khan*, a Belooch Chief.

(No. 175 of 1867.—Political Department.)

The Governor General of India in Council to Sir *Stafford Northcote*, Bart ;
dated Fort William, 7th December 1867.

Sir,

IN continuation of the Governor General's telegram, dated 13th September last, we beg to forward, for the information of Her Majesty's Government, a copy of the correspondence marginally* noted, containing particulars connected with the seizure and release of Lieutenant *Grey*, and the proceedings taken by the civil and military authorities in the matter.

* Telegram from Secretary to Government of the Punjab dated 12th September 1867.	
Ditto - - - ditto - - -	13th September "
From - - - ditto - - -	No. 353-757, 26th September "
To - - - ditto - - -	No. 1,023 - 9th October "
Telegram from - - - ditto - - -	29th October "

SERVICE MESSAGE.

From Murree, dated the 12th September 1867.
From Secretary to Government, Punjab.
To Simla.
To Foreign Secretary.

"THE Commissioner, Derajat, reports that, on the evening of 10th, Lieutenant *Grey*, Officiating Deputy Commissioner of Dehra Ismail Khan, while investigating a criminal case near Tibbee, to the south of the district, was seized and carried off into the hills by *Kowra Khan*, chief of a branch of the *Kusranees*, whose son was suspected of the murder, and that a regiment and some cavalry start this evening by boat with the Commissioner and a number of chiefs, and will reach *Tilihee* to-morrow mornning, when negotiations and punishment will commence."

SERVICE MESSAGE.

From Murree, dated the 13th September 1867.
From Secretary to Government, Punjab.
To Simla.
To Foreign Secretary.

"THE Commissioner, Derajat, reports that Lieutenant *Grey* has been released."

(No. 932.)

COPY forwarded to the Military Department, in continuation of No. 922, dated 13th instant.

By order, &c.

(signed) *J. W. S. Wyllie*,

Under Secretary to the Government of India,
with the Governor General.

Simla, 16 September 1867.

From *T. H. Thornton*, Esq., Secretary to Government, Punjab, to the Secretary to the Government of India, Foreign Department, with the Governor General, Simla (No. 353-757); dated Murree, 26th September 1867.

You have already been informed by my telegrams of the 12th and 13th instant that Lieutenant Grey, Officiating Deputy Commissioner of Dera Ismael Khan, while engaged in the investigation of a criminal case near Tibbee, in the extreme south of the district, was seized and carried into the hills by Kowra Khan, chief of a clan of Kusranee Belooches, and that he has been released. I have now the honour to report, for the information of the Supreme Government, the particulars of the occurrence (so far as they are at present known to this Government) and the proceedings taken by the civil and military authorities.

2. It appears that Lieutenant Grey had grounds for suspecting that Kowra Khan, who is chief of a clan of the above tribe, known as the Tibbee clan, was, with his son, implicated in the murder of a Syud, perpetrated at Tibbee some years ago, but hushed up for a time through the influence of the chief and the venality of the Government officials.

3. With his usual energy Lieutenant Grey determined to proceed in person to investigate the case, and, if necessary, arrest the suspected criminals. Accordingly, on the morning of the 10th instant he started by boat, accompanied by three chuprasees, two office Moonshees, and five mounted orderlies. He arrived at the point of the river nearest Tibbee on the afternoon of the 10th, but unfortunately the boat in which his sowars were conveyed took a wrong channel, and thus got separated from the rest of the party.

4. Lieutenant Grey, without waiting for the arrival of the sowars, proceeded to Tibbee, made inquiries, and summoned the chief and his son into his presence. In obedience to the summons the chief and his son appeared, but the former, who seems to have received some previous warning, came attended by a large following of horse and footmen.

5. With more determination than prudence, Lieutenant Grey placed both the chief and his son in arrest on the charge of murder and abetment of murder.

6. After waiting a considerable time, but to no purpose, for his mounted orderlies, Lieutenant Grey proceeded to despatch his prisoners to the boat in charge of his chuprasees, the only guard he had at his command. No resistance was offered at the time, and Lieutenant Grey remained behind intending to follow shortly.

7. After proceeding a short distance, the escorting party were pursued and surrounded by a rabble of horse and footmen; the prisoners refused to proceed; and Kowra Khan, placing himself at the head of his followers, hastened back to Tibbee; *en route* the party surprised Lieutenant Grey and took him prisoner, and after remaining three hours at Tibbee marched him into the hills by the Bhatee Pass (10 miles from Tibbee) to a place 12 *koss* in the interior.

8. Meanwhile pursuing parties were organised by the adjoining tribes, though full particulars of the mode in which this was effected have not yet reached this Government; and one of them under the command of Sultan Mahomed Khan, Chief of Vihowa, and lately a thanadar in the British service, came up with Kowra Khan and his party; the chief, seeing resistance hopeless, released his prisoner unconditionally.

9. It is satisfactory to be able to state that neither at the time of his capture, nor during the march, was any violence or indignity offered to Lieutenant Grey; and that although repeatedly pressed to guarantee terms of release for himself, he firmly refused to do so. The Government has thus been in no way compromised, and is free to take such measures as may be deemed expedient for punishing the perpetrators and abettors of the outrage.

10. The news of the occurrence reached Lieutenant Colonel Graham, Commissioner of the Derajat, at midnight of the 11th instant; by the evening of the 12th a regiment of infantry and a squadron of cavalry were embarked on the Indus at Dera Ismael Khan, *en route* for Tibbee, when the news of Lieutenant Grey's rescue was received, and the troops returned.

11. On the 13th Lieutenant Grey himself returned to Dera Ismael Khan, and on the evening of the 14th the Commissioner, accompanied by Lieutenant Grey and a company of infantry, proceeded to Tibbee to take measures for punishing all abettors of the outrage in British territory, and securing, if possible, the person of Kowra Khan.

12. Arrangements have been made with the chiefs of the Boozdar and Osterani tribes to bar the escape of Kowra Khan and his followers, and a party, consisting of representatives of all the neighbouring tribes, under the leadership of Sultan Mahomed Khan, has proceeded into the interior to procure the surrender of the chief.

13. According to the last accounts, Kowra Khan, with the remnant of his followers (many of whom have returned), was hemmed in on the south and south-west by the Bozdars, and on the north and north-west by the Osteranis, and his speedy surrender was looked for. A very humble communication had been received from him by the Commissioner, though its purport has not as yet been communicated.

14. The untoward occurrence above reported has, no doubt, mainly resulted from the imprudent rashness of Lieutenant Grey in attempting, almost single handed, the arrest of a Belooch Chief at the head of a large clan of followers; and his Honor, while fully appreciating the energy and firmness evinced by him throughout, has been constrained to express his great regret that Lieutenant Grey should have adopted a course of proceeding which was in every way calculated to invite resistance, and thus seriously to compromise the Government. That he should have been rescued by our own pursuing parties unharmed and without conditions is matter for congratulation, while the loyal spirit evinced by the chiefs and people of our own territory on the occasion is highly gratifying.

15. The proceedings of Lieutenant-Colonel Graham appear to his Honor to have been prompt and judicious, as well as marked by great deliberation and insight into the character of the races with whom he has to deal. He possesses the full confidence of these tribes and their chiefs, and his arrangements have the full approval of this Government. It has not been in his power as yet to find time to report officially the details of the late occurrences, and his own proceedings cannot be brought to any definite conclusion until Kowra Khan has either surrendered, been captured, or slain, unless, indeed, he should succeed in forcing his way through the hill tribes beyond him, and thus effecting his escape, of which there appears at present to be little or no likelihood. So soon as a detailed report reaches this Government, a copy shall be forwarded for information.

From *J. W. S. Wyllie, Esq.*, Under Secretary to the Government of India, Foreign Department, with the Governor General, to the Secretary to Government, Punjab (No. 1,023); dated Simla, the 9th October 1867.

I HAVE laid before the Governor General in Council your letter, No. 353, dated 26th ultimo, reporting particulars connected with the seizure of Lieutenant Grey by a Belooch Chief, and the proceedings taken by the civil and military authorities in consequence.

2. In reply, I am directed to state that his Excellency in Council concurs in the views of the Lieutenant Governor, and considers that Lieutenant Grey acted most injudiciously. The further report promised in the last paragraph of your letter is awaited with interest.

SERVICE MESSAGE.

From Murree, dated the 29th October 1867.

From Secretary to Government.

To Simla.

To Foreign Secretary.

“KOWRA KHAN, who carried off Lieutenant Grey, his son, Jehanger Khan Yaboo Khan, and the remaining refugees have been brought in, having been given up by the Moosa Khails, under pressure of the allied tribes, to the Kusranees, who brought him in. No collision among the tribes; no lives lost; tribes dismissed to their homes. The Lieutenant Governor considers that Lieutenant Colonel Graham deserves very great credit for the successful issue of this affair.”

(No. 36 of 1868.—Political Department.)

The Governor General of India in Council to Sir *Stafford Northcote, Bart.*;
dated Fort William, 4th March 1868.

Sir,

IN continuation of our Despatch, No. 175, dated 7th December last, we have the honour to forward copy of correspondence with the Punjab Government, regarding the circumstances attending the seizure of Lieutenant Grey by Koora Khan, the Kusrani Chief.

(No. 52-26, dated 11th January 1868.)

From Officiating Secretary to Government, Punjab and its Dependencies, to Secretary to Government of India, Foreign Department.

WITH reference to paragraph 2 of your letter, No. 1,023, dated 9th October last, I am now directed by the Honourable the Lieutenant Governor to submit, for the information of his Excellency the Viceroy and Governor General in Council, a copy of a letter, No. 156, dated 9th December 1867, with enclosures, from Lieutenant Colonel Graham, Officiating Commissioner of the Derajat Division, reporting on the seizure of Lie-

tenant Grey by the Kusranee Chief, Kowra Khan, and to communicate the following remarks :—

2. The Lieutenant Governor's opinion was fully expressed in regard to the earlier proceedings in this case in Mr. Thornton's letter of the 26th September last. It is unnecessary to go over the same ground here.

The Lieutenant Governor then remarked on the excellent spirit shown by the tribes generally, and this has been most fully borne out by the result, as no more remarkable sight could be witnessed amongst such races than that of a powerful tribe, nearly strangers to us, being constrained by the pressure of the tribes-men of the offender himself to surrender that offender, who had sought and found an asylum with them.

The Lieutenant Governor expressed at the same time his high appreciation of the combined firmness, moderation, impartiality, and thorough cognizance of the races and individuals with whom he had to deal, which had throughout been evinced by the Commissioner, Colonel Graham; and his subsequent proceedings have tended but to confirm and enhance that opinion. He is entitled to the hearty acknowledgments of this Government for the ability with which he has brought to a successful conclusion a very delicate matter, and converted what might have led to disastrous results, into a means of greatly improving our relations with the frontier tribes, a result which the Lieutenant Governor is thoroughly satisfied has ensued. The measure adopted by him, of working through the tribes themselves, must be regarded as in a great measure original, and was by no means unattended with danger, inasmuch that the apprehensions of more than one of our frontier officers were at one time excited. But the vigour with which he was enabled to control and restrain them, aided by the tact, geniality, and energy, more especially of Captain Sandeman, and the heartiness with which his orders were carried out or anticipated by all, have effectually obviated all cause for alarm, and the result has shown how correctly he had made his calculations.

3. As regards Lieutenant Grey, it is impossible to acquit him of rashness and too great impetuosity, as remarked in Mr. Thornton's letter; and at first the Lieutenant Governor had feared that it would be necessary to withdraw him from the frontier. But while this could not but have had in some ways a bad effect, the Lieutenant Governor has on other grounds deemed it right to retain him at his post. He has evinced many admirable qualities for such a post,—intelligence, energy, courage, and an aptitude for checking irregularities on the part of subordinates; and as the events which have occurred afford a lesson, with the importance of which the Lieutenant Governor believes him to be fully impressed, the Lieutenant Governor has every confidence that he will prove a valuable frontier officer.

4. While the Belooches and their leader generally have conducted themselves with so much loyalty and heartiness, it is to be feared, more perhaps from favourable mention of them having been omitted than from anything stated to their disparagement by Colonel Graham, that such hearty aid was not rendered as ought to have been the case at the most critical time by some of the Pathan leaders, to whom we had every right to look for support. In the case of some, more especially that of Sultan Mahmud Khan, the Khetran Chief of Vihowa, much allowance must be made; but the fact is nevertheless greatly to be regretted, and, but for Colonel Graham's tact and forbearance, might have led to worse consequences. The presence of the Pathans, however, had doubtless a stimulating and beneficial effect upon the Biluches; while the thoroughly loyal and hearty bearing of the Nawab of Dera was of the greatest value and importance; and good service was also done by some of the Gundapoor Pathans, and others also.

5. The Kusranee tribe itself was of necessity greatly tried, and it cannot be wondered at that sympathy with Kowra Khan was largely shown by it. This was, however, much less conspicuous amongst the portion belonging to the plains than those of the hills; and the young Chief, Fuzl Ally, who is included amongst the former, though inexperienced, poor, and surrounded by bad advisers, appears, on the whole, to have conducted himself well, and thus entitled himself to future consideration from us.

6. The account given by the Commissioner and Mr. Beckett of the high state of efficiency of the frontier force is highly gratifying to the Lieutenant Governor, whose acknowledgments have been communicated through General Wilde, Commanding the Frontier Force, to Colonel Hood, Captain Vivian, Captain Keene, and Captain Ripley, for their promptitude, energy, and excellent arrangements. The promptitude and efficiency of the cavalry in particular were worthy of all admiration, and the whole of the proceedings of the military authorities were such as to reflect the highest credit on the arrangements and spirit of the Frontier Force.

7. The distribution of the reward of 10,000 rupees, and the conferment of the khilluts, as detailed in paragraphs 47 and 52 of the Commissioner's report, have been approved and sanctioned by the Lieutenant Governor. The prompt and handsome recognition of the services of the chiefs and tribes by the Commissioner, shown in his distribution of these rewards and honours immediately on the surrender of Kowra Khan, cannot but have had the best effect. I am to remark, however, with reference to paragraph 41, that the reward of 10,000 rupees was offered only for the seizure of the four principal offenders, not for their lives.

8. The Lieutenant Governor proposes to take an early opportunity of giving Allahdad Khan, son of the Nawab of Dera, a trial in the public service. On account of his rank and position, and the influence of his father on the frontier, he has been granted a personal allowance of 200 rupees a month in connection with the frontier militia, which he has drawn for several years. On his first appointment he will have to officiate, receiving less than the substantive pay of an Extra Assistant Commissioner; and I am to propose that, as a special case, in the event of his employment, he may be permitted to continue to draw 100 rupees or 150 rupees of the personal allowance, till it be absorbed by his promotion in due course. In the opinion of the Lieutenant Governor, 100 rupees is the very least that should be allowed him out of the allowance he now draws, both from consideration to the Nawab, his father, and his own loyal services.

9. The Lieutenant Governor has approved of the Commissioner's arrangements (p. 61), in leaving, as a temporary measure, a small force at Vihowa and Mungrota.

10. With regard to the prisoners now in custody, 120 in number, the Commissioner has been instructed to detain only those who were actively concerned in carrying off Lieutenant Grey, or in aiding and abetting the offence. He has also been directed to report, for information, the sentences eventually passed.

11. The services of Mr. Beckett have been acknowledged, and the cordial thanks of the Lieutenant Governor have been communicated to Lieutenant Sandeman, to whose influence over the Kusranee and Belooch tribes, and activity in carrying out the Commissioner's plans, the success of these operations is in no small degree due.

12. The return of the map* sent herewith in original is requested.

* Not yet received from India.

(No 156, dated 9th December 1867.)

From Lieutenant-Colonel *Graham*, Officiating Commissioner and Superintendent, Derajat Division, to Officiating Secretary to Government of Punjab, Lahore.

I HAVE the honour to report the particulars of the late affair in which Kowra Khan, chief of a branch of the Kusranee tribe, resident at Tibbee, in the Dera Ismail Khan district, seized and carried off the Officiating Deputy Commissioner, Lieutenant Grey, into the hills; of the release of that officer from the hands of his captors; and of the capture of Kowra Khan and the other offenders concerned in this daring outrage.

2. My constant telegrams and demi-official reports have already informed the Government of the progress of events as they occurred, and of the policy pursued in regard to them, and the accompanying copies of reports from Mr. Beckett, Assistant Commissioner, Lieutenant Grey, Officiating Deputy Commissioner of Dera Ismail Khan, and Lieutenant Sandeman, Officiating Deputy Commissioner of Dera Ghazee Khan, will fill up the details of the official narrative which it is now my duty to submit.

3. The sketch map accompanying Lieutenant Sandeman's report will further illustrate the scene of the operations to be described.

4. Lieutenant Grey's report details his reasons for attempting the arrests in the manner described, the reasons for his failure, and the consequences of it. It is for the Government to judge of the necessity or expediency of his so acting (my own opinion having been given in the demi-official reports above alluded to); but I may here mention that, having since tried the murder case which led to the arrests, I find it to have been a very gross case of culpable homicide, if not of actual murder.

5. I may also mention that I have since tried the case of abduction charged against Meer Alum Khan, Rais of Moosazai (with which the present outrage is so far connected) that Kowra Khan excuses himself on the plea that he expected to be similarly disgraced), and find it to have been a very gross case of abduction.

6. I further consider it my duty to record my belief that the discovery and punishment of these two cases, the first of which was concealed for nearly six years, and the second would not have been reported had Lieutenant Grey not been on the spot, or acted less promptly and decisively, cannot but have a most beneficial effect on the general administration of the district.

7. Nor can it be doubted that Lieutenant Grey, once placed in the position of a captive, maintained, as far as possible, the name and character of a British officer, refusing to make any terms whatever on his own account, and so to compromise the Government, and consenting only to be the bearer of certain polite messages to the Government on the part of Kowra Khan.

8. Mr. Beckett's report describes the action taken by him on receiving the intelligence at Dera Ismail Khan, which was prompt and judicious. I fully endorse all that Lieutenant Grey has said in Mr. Beckett's favour on this head.

9. The news reached me at Sheikhbooddeen at midnight of the 11th September; I started in an hour, and reached Dera at 8 a. m., met the chiefs and principal native gentlemen as I neared the station, and took them with me straight to the house of Colonel Hood, commanding the district.

10. It was soon determined that the available infantry should proceed by boat to Tibbee, from which place our future operations should be directed; orders were issued, and the troops embarked the same evening (12th), the cavalry having started the evening before by road, as described by Mr. Beckett.

11. I here beg to record my due sense of the courteous and hearty co-operation afforded me by Colonel Hood, who at once appreciated the occasion, and was ready to meet it with prompt advice and aid.

12. I also beg to record my testimony to the high state of efficiency of the Punjab frontier troops, as evinced by the extraordinary celerity with which the 1st Regiment of Cavalry, under Captain Vivian, was, within two hours, in the saddle, marched 33 miles during the night, over an almost impracticable road, and was again pushing forward when met by the news of Lieutenant Grey's release; and was almost immediately, after its arrival at Meeran, joined by its camp equipage and followers, having required no assistance whatever from the civil authorities (*vide* Mr. Beckett's report).

13. With almost equal despatch the 1st and 4th Regiments of Infantry, under Colonel Hood and Captain Keene, were embarked, with camp equipage and stores complete, by 8 p. m. (having received orders only at noon); and one regiment (the 4th) had actually started when the news of Lieutenant Grey's release reached us, and the troops were at once ordered back to their quarters.

14. Although these troops were not required, still their perfect readiness and prompt dispatch, and the eager spirit with which the men, under the direction of their European officers, embarked their stores, &c., on the boats, as witnessed by the principal Native chiefs and residents from the Ghauts, could not fail to be appreciated by a people prone to mark such matters.

15. The affair had now assumed a diplomatic form, and I determined to await at Dera the arrival of Lieutenant Grey, and to be guided by the information I should obtain from him.

16. On the evening of the following day (13th) Lieutenant Grey reached Dera, and on the next evening (14th) we left Dera (Lieutenant Grey and myself, accompanied by most of the chiefs) by boat, escorted by a company of infantry, for Tibbee, a troop of cavalry having been also directed to join us from Meeran.

17. The command of this party devolved on Captain Ripley, second in command of the 1st Regiment of Cavalry, to whom my best acknowledgements are due for his courteous and prompt attention to my wishes at all times. This detachment also carried its own stores, &c., and was always ready to march at an hour's notice, without any aid from the country, and was exposed to a somewhat harassing service for six weeks without a single complaint of any kind.

18. I reached Tibbee on the evening of the 15th, and on the following day entered on the measures which I conceived to be necessary for securing the persons of Kowra Khan and his abettors, with a view to bring them to speedy punishment.

19. I had early made up my mind that it was necessary, if possible, to effect this object, for the following reasons:—

The nature of the outrage involved the greatest indignity that had ever been passed on a British officer on this frontier, which was enhanced by the subject of it being the Chief Civil Officer and Magistrate of the District. Again, the nature of the outrage was of that sort, that the very boldness and audacity of it on the part of a leading and influential chief, who had, after its commission, sought the shelter and protection of his tribe as an outlaw in the hills, was likely to induce, not only his own tribe, but many of the lawless spirits among the adjoining tribes, to join him in forays into the plains. It was expedient, in an administrative point of view, to impress on the minds of the people, both within and without the border, that the game of kidnapping or carrying off Government officials into the hills was a dangerous and losing one.

It was politic to avoid the spectacle of a criminal of that stamp openly defying our power, and, encouraged by impunity, gradually infecting the good spirit of the surrounding tribes, so that the Government at some future period would have probably to punish the very tribes which now I felt sure were ready to side with us in the cause of peace and order.

I desired to save the necessity of a military force entering the hills, which, after long delay, might probably not effect so completely the real objects in view, or secure the just punishment of the real offenders.

Lastly, it was necessary, to have due effect, that punishment adequate to the offence should be inflicted as promptly as possible.

20. For all the above reasons I determined to secure the persons of the offenders, and to bring them to justice.

21. But I also determined that no treachery or compromise should be employed to effect this object, either of which expedients might have brought Kowra Khan to my feet in a week, but the after effects of which would have been felt by the Government in loss of dignity and in impaired administration.

22. I therefore gave out publicly that if Kowra Khan complained of having been brought in treacherously, I would send him back to the hills; and I steadily refused to make any conditions

conditions as to the nature or extent of his punishment, save only that if he came in himself, or was brought in by a deputation, his life would be spared.

23. Bearing the above principles in mind, I first addressed myself to securing my object by diplomacy, and selecting Sultan Mahmood Khan, chief of Vihowah, who had already signalised himself by rescuing Lieutenant Grey, and whose influence in the hills was the most constantly and actively employed, and whose influence with Kowra Khan was also great, I associated with him the representatives of the surrounding tribes (including the Kusranee chiefs), and deputed him to Kowra Khan, with instructions to refuse him, in the name of their tribes, shelter within their respective boundaries, and thus either to induce or to compel him to come in, on the understanding that strict justice would be done, and that I should be prepared to receive, in return for such service, and to give due attention to a recommendation to mercy on the part of the tribal representatives.

24. The deputation started from Tibbee, but before it reached its destination action had been taken by a war party of our subjects (Oosteranahs, headed by the two Gundapore chiefs, Kaloo Khan and Nowrung Khan), which Lieutenant Grey on his release had dispatched into the hills. It appeared that Kowra Khan, in order to deceive this party, by which he was closely beset, had dispatched 10 horsemen during the night by an unguarded pass into the hills beyond; in the morning the tracks were discovered, and the Gundapore chiefs pursued hotly after, and at evening came upon the fugitives (who had halted and dismounted), and would have slain or captured them if they had not saved themselves by flight up the hill side on foot, leaving their horses in our hands. The pursuing party followed over the hill, but soon found that they had entered the country of the Zinurrees, who, though very friendly to us, would permit no fighting without making tribal cause of it; our party, therefore, entered a Zinurree Kirree, and in the name of Government and their own, and of the Oosteranah tribe generally, whose country adjoined, demanded the surrender of the fugitives, of whom three were immediately given up (being in the Kirree) and, with the horses, brought in.

25. It was at first naturally concluded that Kowra Khan was among this party and had thus escaped; the war party, therefore, as also the peace party (whose diplomatic labours had so nearly been anticipated by this bold dash), thinking their further efforts arrested, returned for fresh instructions to my camp.

26. The "ruse," however, was soon discovered, and I now determined to employ a second deputation, though of a different nature from the first; and to give greater effect to it moved my camp forward to Vihowah, the family seat of the chief, Sultan Mahmood Khan, and within three miles of the hills, whence also future operations could be more effectively watched and instructions issued.

27. I now sent for Nawab Foujdar Khan, and set before him the position he occupied, having already done such distinguished service and received adequate honours, and so lately having been invested with the high honour of the "Star of India," and explained to him how his responsibilities were proportionately increased, and that the present was an occasion on which it was necessary he should exert the influence which it was well known he possessed in the matter of bringing to justice a criminal who had offered so great an insult to the Government.

28. The Nawab agreed with me, and left me to consult with Sultan Mahmood Khan as to the means to be employed, and shortly after returned with his cousin, Nawab Gholam Hussan Khan, and Sultan Mahmood Khan, and with the proposition that the two latter (he being himself too infirm to undertake such a journey) and the Kusranee chiefs should proceed as a deputation to Kowra Khan (who was known to be still in the Kusranee hills), and setting before him his position induce or compel him to come in; to this deputation also I pledged myself to attend duly to their recommendation to mercy.

29. But there seems reason to doubt whether this deputation acted in good faith, and, in truth, it was a hard task to impose upon Sultan Mahmood Khan, who is known to have regarded Kowra Khan as a brother, especially when I firmly refused to make any conditions with the criminal, from which it was naturally concluded that the intended punishment was severe.

30. It is reported that Kowra Khan received the deputation in the evening at the head of 100 men (our own party numbering 80), and sending forward food for their entertainment, himself conferred for a few minutes only, and then retired to a selected fastness a few *coss* off; in the morning the parties met, with the same ceremony, and the conference was long and recriminating, and ended in utter failure.

31. I had before determined to deal with the Kusranees as a tribe, for the part they had taken in this affair, *after* I had secured the person of Kowra Khan; I now, on the failure of diplomacy, and still recognising the necessity of securing the criminals, determined to deal with the criminals and the whole tribe at once, and to compel the surrender of the criminals at the hand of their own tribe, which I knew was the only way to effect the object without bloodshed.

32. But the Kusranees had so far committed themselves, that it was necessary first to coerce this tribe before I could compel them to this service. I therefore summoned the following tribes to my assistance from the north:—the Pathan tribe of Oosteranahs (600), who live principally in the hills but cultivate in the plains, under their chiefs; with them I associated the two Gundapore chiefs above mentioned, with a few of their clan, 120 horse and foot of Babars, and a similar number of Mian Kheyls, all our subjects, and under their

own chiefs; to the above was afterwards added a party of Sotes (a Pathan tribe near the Zinurrees), whose chief, with a kafila of 80 camels, we had seized at Vihowah, and detaining the latter dispatched the former with his following (20, increased afterwards in the hills to 100) in charge of a convoy of provisions to join our army of the north.

33. From the south I called up the Boozdars (1,000), the hill tribe which received such severe chastisement at our hands in 1857, and the Huddianas (700), the hill portion of the Lugarees, and Loonds (400), our subjects all Belooches, and all under their own chiefs, which formed a force which soon became designated the army of the south.

34. To these forces was committed the duty of blockading the hill Kusran tribe on the north, south, and west sides, and, as we hoped, the criminals within them. When the blockade was complete, I summoned the whole of the Kusran chiefs, hill and plain, who immediately obeyed the summons.

35. It was at this time that Lieutenant Sandeman, who had been on leave at Simla, but generously and zealously threw it up and joined me in this difficulty, arrived at Vihowah, and we received the representatives together.

36. The following terms were dictated to the chiefs to bring in the criminals, under the following penalties:—1st, forfeiture of allowance for guarding the hill passes; 2nd, confiscation of standing crops as a fine; 3rd, deportation of the plain chiefs to Dera Ghazee Khan; 4th, blockade of the hill portion of the tribe, who are almost entirely dependent for means of subsistence on their cultivation in the plains.

37. The chiefs at once took up their responsibilities, and collecting their clansmen in the plains entered the hills, and returned in a few days with 22 families, including about 40 women and children, belonging to the rebels.

38. In the meantime we thought it wiser to divide our camps, and accordingly Lieutenant Sandeman, with Mr. Beckett, took up a position at Kot Kusran, the family seat of the Kusranee chief, and thence, under my instructions, directed the movements of the Belooch army of the south.

39. I desire here to record my warm acknowledgement of the excellent service performed by Lieutenant Sandeman; the Kusranees belong to his district, and the Belooch tribes generally are so amenable to their chiefs, and Lieutenant Sandeman's influence over the latter is so strong, that much of the credit is due to him that matters were pushed so speedily and satisfactorily to a conclusion.

40. The Kusranees were now mustered by Lieutenant Sandeman and again dispatched to the hills to perform the essential duty of bringing in Kowra Khan; with them were associated, as advisers and supporters on the part of Government, a chief and 50 Khosahs, and as many Goorchanees, under a chief. The tribe returned after some days with five of the principal rebels, but at the same time it was known that Kowra Khan and his son and others, escorted by about 80 of the hill Kusranees, had escaped beyond the Black Mountain, and sought shelter with the Moosa Kheyl, the most considerable Pathan tribe of those parts.

41. To guard against such escape, or to make such shelter more difficult, I had proclaimed a reward of 10,000 rupees on the heads of the four principal rebels, and to provide the means of payment of the reward of feeding the allied forces, and of meeting the fines which would hereafter be inflicted on the criminals, the moveable property of Kowra Khan, and of a few of his chief abettors, had been seized and sold, producing in a month upwards of 20,000 rupees, besides the vast quantities that must have been carried into the hills—a fact which at once proclaims the wealth of this rebel chief; and when operations in connection with his tribe were set on foot against him, it was soon found that he had far more influence with the tribe, especially with the hill portion of it, than the real chief, who is a young lad of 22, and miserably poor. The above will afford an estimate of the man, and of the difficulties we had to contend with.

42. At the same time that property was being seized and sold, arrests were being made of numbers of the Tibbee Kusranees, who had escorted Lieutenant Grey to the hills, and afterwards endeavoured to return to their homes, but were marked down, and secured almost as fast as they arrived, so that in a month we had nearly 100 prisoners in our hands.

43. The Kusranees now thought their responsibilities at an end, as they had brought in the rebels within their bounds, and Kowra Khan had escaped beyond them; but this excuse was not allowed, and they were ordered to the hills once more to do their duty, or submit to the penalties; at the same time the blockading forces were closed together, and, with the Kusranees, the whole allied force showed front to the Moosa Kheyls.

44. The allied forces had received constant instructions on no account to fight, either with any of the Pathan tribes, or with the Kusranees, or with each other. The chiefs were held responsible for this; their duty was simply to blockade the Kusranees, then to see that the latter seized the rebels in their own hills, and now to support the Kusranees in their demand for the surrender of the rebels of their own tribe at the hands of the Moosa Kheyls; and well did they perform these duties. Camped away from their own country for a month, on the boundaries of other tribes, with which their own might happen to be at peace or war, and at peace or war with each other, these friendships or animosities were held in abeyance for the time, and the Government work held foremost in their thoughts; not a single collision of any kind occurred, not a drop of blood was spilt, not a goat plundered (except

the trifling occurrence mentioned by Lieutenant Sandeman), no fresh enmities were created from the time the forces were collected together till, having done their duty, they were dismissed to their homes.

45. The Kusranee Jirga was now pressed on to the Moosa Kheyls, whose attention was naturally turned to the point of danger, thereby exposing their other boundaries to the attacks of their enemies, who took advantage of the opportunity to carry off some cattle. A party of 11 Moosa Kheyls had been seized in the Oosteranah Hills and brought into camp, whose clan now demanded that Kowra Khan should be given up in exchange for their prisoners in our hands. A notable Hill Syud was employed by our chiefs to mediate (Kowra Khan's son had murdered a Syud); parties of the allied forces, tempted by the reward, and expecting Kowra Khan to attempt an escape (in which case they had permission to seize him *en route*), hovered about the tower which the Moosa Kheyls had given him for shelter, so that the wretched inmates, some of whom were women, went out for the purposes of nature under a guard of matchlock men: the allied forces still threatened and moved closer, and the "Sahib log," who, it had been expected, would long since have tired of the game and gone home, still camped at the passes, and threatened, and urged on; a military force, it was said, would enter the hills in the spring, and decimate the Moosa Kheyls, and destroy their crops and cattle; so the Moosa Kheyl, under this joint pressure, thought it advisable to give in; Painsa Khan, their chief, himself made Kowra Khan over to the Kusranee Jirga, and to a deputation of our chiefs sent from the army to receive him, and himself accompanied him to British territory, where he arrived on the 27th October, and made him over to Lieutenant Sandeman, who was waiting at Mungrota to receive him.

46. It may here be stated that Kowra Khan's deposition was taken by Lieutenant Sandeman within an hour after his arrival, and that he did not even allude to any hope of pardon or compromise having been offered to him.

47. Our object having been accomplished, I received the assembled chiefs, including those of my camp, the chiefs who had commanded the forces in the field, and those who had accompanied our prisoners from the hills, in Durbar, where, after addressing a few words to them, I distributed the promised reward to the allied tribes as below:—

	Number of Fighting Men.	Rupees.
To the Boozdars - - - - -	1,000	2,500
„ Huddianees - - - - -	700	2,000
„ Loonds - - - - -	400	1,000
„ Oosteranahs - - - - -	500	1,000
„ Khosahs - - - - -	50	700
„ Baburs - - - - -	120	750
„ Mian Kheyls - - - - -	120	750
„ Sotes - - - - -	100	300
„ Goorchanees - - - - -	50	300
„ Nootkanees - - - - -	50	500
„ Gundapoors - - - - -	40	200
TOTAL - - - - -	3,140	10,000

And at the same time bestowed the following khilluts on the commanders of the forces:—

To Jumal Khan, Lugaree - - - 500	To Mahomed Gool Akhoonzadah, Babur 300
„ Kaloo Khan, Gundapoor - - - 500	„ Mihr Shah, Syud - - - 250
„ Painsa Khan, Moosa Kheyl - - - 500	„ Nihal Khan, Boozdar - - - 200
„ Ashuk Khan, Boozdar - - - 400	„ Fyz Mahomed Khan, Mian Kheyl - 150
„ Nowrung Khan, Gundapoor - - - 400	„ Dadoo Khan, Babur - - - 150
„ Gholam Hyder Khan, Loond - - - 400	„ Poordil Khan, Mian Kheyl - - - 150
„ Gholam Hyder Khan, Khosah - - - 400	„ Rissaldar, 1st Punjab Cavalry - 100
„ Zuman Shah, Syud - - - 300	„ Subadar, 1st Punjab Infantry - - 100
„ Rumzan Khan, Oosteranah - - - 300	
„ Fatty Khan, Oosteranah - - - 300	TOTAL - - - 5,400

The whole of the above tribes and chiefs having been for upwards of a month employed in the service of Government, away from their homes and families, 20 and 30 miles inside the hills.

48. The feeding and miscellaneous political expenses of the above force has amounted, in round numbers, to 15,000 rupees; and it is proposed to charge this sum, as well as the 10,000 rupees reward, to the criminals, and to the Kusranee tribe generally (who have provided this entertainment for us), taking the item into consideration in apportioning the judicial fines among the former, and to charge the khilluts to the Government; to which propositions I now solicit sanction.

49. I have further to solicit that the Government will be pleased to bestow an honorary letter upon Nawab Surfuraz Khan, of Dera, accompanied by a khillut of 3,000 rupees, as an acknowledgment of the loyal example set by him to the whole of the chiefs as their head. The part he took was unmistakeable, and went far to counteract the effects of the lukewarmness shown by a few chiefs whose names have been demi-officially brought to the notice of Government; and when it became necessary to place Sultan Mahmood Khan in an honourable but strict arrest, I was glad to have so trusty and noble an adherent at the head of my chiefs with whom to place him.

50. Nawab Surfuraz Khan has been put to considerable expense, too, in the entertainment of numerous petty chiefs who flocked to the camp from all parts to offer their services, and mostly became guests of the Nawab; and I may add, that I have since had to replace Sultan Mahmood Khan as a guest of the Nawab for political reasons, at whose expense he is still entertained, with 15 of his followers, and has been so for the last month; so that I doubt whether the amount of khillut asked for will more than pay his actual expenses.

51. I shall be glad also if the Government will, as soon as possible, provide for the Nawab's eldest son, Alladad Khan, as an Extra Assistant Commissioner, for which appointment, I have been informed, his name has been down on the list of candidates since August last.

52. I further solicit that Government will be pleased to bestow honorary letters on the following Native gentlemen, all of whom were present in my camp from first to last of the affair, and all did their duty:—

Mahomed Ukbur Khan (Khuttee Kheyl, son of the Nawab of Tonk).
 Mahomed Hyatoollah Khan, Suddoozai.
 Abdool Kureem Khan, Suddoozai.
 Gholam Surwur Khan, Khagwanee.
 Hafiz Summundur Khan, Khwajukzai.
 Alladad Khan, Suddoozai.
 Abdoolla Khan, Eesa Kheyl.

The other chiefs mentioned in paragraph 47 have received honorary letters with their khilluts from myself.

53. Having now brought this Report (which has unavoidably grown to a great length) to a conclusion (I beg to refer for further details to Lieutenant Sandeman's Report), I venture to offer a few general remarks on the results which have been attained by the late tribal expedition.

54. The undertaking was essentially a Government one; of the allied forces, nearly half were our subjects of the plains, as were *three-fourths* of the leaders; the whole force acted *directly* under the orders of Government; lines of communication (express) being kept up between the forces and my own and Lieutenant Sandeman's camps. Councils of three and four head chiefs were formed in each allied camp, under whose joint signatures all despatches were received, and who similarly received their instructions. Not a step was taken without positive permission; if it had not been so, and if the tribes thus called together had been left to their own devices and desires, it is easy to foresee what would have been the consequences.

55. It is the unhesitating opinion of every military man with whom I have spoken on the subject (some of whom have mentioned that they had heard the same from their Native officers) that the effects of the tribal expedition, as having effected its object without cost of blood or treasure, as having forced the misbehaving tribe to give up its own rebels, and having reached promptly the *real* offenders, and brought *them only* to punishment, have been greater than those of any military expedition could have been.

56. It was a time and an occasion fitted to gauge the loyalty and sincerity of our chiefs of all ranks and tribes, and to prove the *real* relations which exist between the British Government and the border tribes.

57. Never again, I believe, will the saying be heard, heretofore so common all along the border, when some man of consequence conceived himself aggrieved (and was actually said to me in March last by *Kowra Khan* himself, who had lost a land suit in court, and his appeal been rejected from Lahore), of "*ludke puhar ko chula jawega*," without a laugh being raised against the speaker; this is even now a common joke among the people.

58. The way has been paved towards an improved state of relations with the border tribes,

tribes, a result desired by the Government, and doubtless our true policy. I cannot better illustrate this effect, and the improved sense of security felt generally, than by mentioning that, some time before Kowra Khan's capture, Lieutenant Sandeman consulted me in the matter of his going into the hills on his border, to see for himself some coal beds said to exist there, when we both considered that, after what had happened, the proceeding would be unwise; but after the capture of Kowra Khan the feeling was reversed, and it is now felt that an European officer could safely, with due precaution, visit the hills in those parts anywhere.

59. I cannot close this Report without mentioning the great assistance I received from Lieutenant Grey, who remained in my camp throughout these operations, and acted under my orders; the manner in which the rebels and their property were marked down and secured elicited my constant admiration, and contributed much to the general effect of the example made of the rebels.

60. Mr. Beckett also is reported to have worked well under both Lieutenant Grey and Lieutenant Sandeman.

61. It has been considered advisable to leave a troop of cavalry and some infantry at Vihowah, a similar force being at Mungrotah (thus holding the Kusranee country between them), for the present, the tribe having been somewhat disturbed, and a fine and a few insignificant refugees having still to be exacted from them; but these are only precautionary measures; in reality, the peace of the border was *never better secured*, nor so likely to last without disturbance.

62. A punitive police post has also been established at Tibbee, to be paid for by the people, sanction to which measure will be duly sought.

63. In conclusion, it may be mentioned that the lands and immoveable property of the criminals have not been touched, so that the relatives and dependents of the criminals, and the criminals themselves, after their release from prison, can at once settle down again as peaceful subjects, after having received a lesson which they and their descendants are not likely to forget, and which they certainly deserved.

N.B.—In the above case there are about 120 prisoners in gaol awaiting their trial, besides which, suitable fines will be imposed on the villages near to some of which Lieutenant Grey passed on his way to the hills, and others were called upon for help by the escaped Moonshees and orderlies of Lieutenant Grey, but rendered no assistance.

(No 287, dated October 1867.)

From Lieutenant Grey, Officiating Deputy Commissioner *Dera Ismail Khan* to
Officiating Commissioner and Superintendent, Derajat Division.

I CALLED for this Report, considering that view should not be lost of the energy and judgment displayed by Mr. Beckett, or of the extraordinary celerity and promptitude of the movements of the cavalry. Mr. Beckett appears to have done exactly the right things at the right times, and from what I have heard from the military and from Natives of his proceedings throughout, it is evident that he acted with great decision, discretion, and zeal. For the cavalry, who were just going to parade, to be on the line of march at two hours' notice, without any assistance in carriage or otherwise, and to have everything with them at the end of a sudden 33-mile march, within a few hours after reaching their ground, to their very mess tents, will speak for itself to those within whose province it lies to appreciate their efficiency.

(Dated 29th September 1867.)

From Mr. Beckett, Assistant Commissioner *Dera Ismail Khan* to Officiating Deputy
Commissioner *Dera Ismail Khan*.

ACCORDING to your request, I have the honour to submit a report on the action which was taken when the news arrived at the cantonment of your having been carried off into the hills.

At about 3 or 4 p.m., on the 11th instant, as I was sitting in Kutcherry, a man brought in a short petition from the Mohurir of Dera, Futteh Khan, in which it was stated that Kowra Khan, Lumberdar of Tibbee, and a chief of the Kusranee tribe, had surrounded you and taken you off with him to the hills. I did not doubt the truth of this report, as I knew you had gone down to Tibbee to arrest Kowra Khan and his son, and to investigate a case of murder which occurred some years ago in which both were implicated. I immediately went over to Colonel Hood, commanding the station, and communicated the

news to him; I also sent off an express to Colonel Graham, the Commissioner, at Sheikboodeen. Nowrung Khan, Gundapoor, was with me at the time; I started him off at once for Vihowa, and I wrote to Gool Khan, Akhoonzadah, and the Oosteranah Mullicks to be on the alert and to give what assistance they could. I first proposed to Colonel Hood to send some infantry down in a boat to Tibbee, but he thought that as a whole day had elapsed from the time you had started, that probably you would either have been rescued, or reached the hills; and that in the event of the latter supposition turning out true, that it would be useless to send troops as they could not follow into the hills; it was therefore agreed that nothing should be done till the Commissioner's wishes were known. On further examining the man who had brought in the news, and who himself was present when you were surrounded, I learnt that Kowra Khan had taken the direction of Kot Kusranee, and meant to enter the hills with a view of getting to the town of Beatee. I thought at first that he meant the Boozdar capital; however, I hoped that, if Fuzul Khan, the head chief of the Kusranee tribe, who lived at Kot Kusranee, did his duty, Kowra Khan would be prevented getting to the hills, and that his retreat would be effectually cut off. I explained this to Colonel Hood with a view to the cavalry being sent out, as there was a chance of their arriving in time to render material assistance in the event of Kowra Khan's retreat having been cut off: and that anyhow the advance of the cavalry could do no harm, and would have a good effect in reassuring the people of the district. Colonel Hood acquiesced, and immediately sent orders to Captain Vivian, commanding the 1st Punjab Cavalry, to take his regiment out. Colonel Hood also approved of my accompanying the troops, which, though it left the station without a civil officer, Lieutenant Bartholomew could come down by the next day from Sheikboodeen. I took Colonel Hood's orders to Captain Vivian at about five o'clock, or a little after, and by seven all the officers and men available for duty were in the saddle. Before starting, I sent for the Tehseeldar and ordered him to collect boats at the Sheikh Yusuf Ghat, and to send up to Kanjun for more; I also ordered him to get together as many camels as he could by morning. The Nawab of Dera, Hyatoollah Khan, and Gholam Surwur Khan, Khagwanee, with a number of others, came to me as we were starting and requested permission to accompany, but I pointed out that it was their duty to wait till the Commissioner arrived. I took Rub Newaz Khan and Secunder Khan, Alizais, and four police sowars to assist in procuring supplies. The cavalry started without requiring any assistance in the way of carriage, and by dawn next morning we arrived at Meeran, a distance of 33 miles; the road was very much cut up on account of the inundations from the Soonee and the recent rains, and we had to halt several times to gain information and to procure lights to enable us to read the letters which we received on the road from Mirza Yar, Serishtadar, and others. On our arrival at Meeran, I found that the Naib Thanadar could give us no information further than what we had already heard, and Captain Vivian ordered a halt that his men might get some rest and food after their long night's march. I sent off the Naib Thanadar to Jullowallee to gain information, and at about 10 o'clock the Mohurir came saying he had just heard that Kowra Khan had been stopped and had not effected his retreat into the hills. There was great difficulty in obtaining supplies at Meeran, as we arrived there suddenly, and very little is procurable at the place itself; grass, however, was abundant, and the Nawab's agent did his best to procure what could be got from his jaghire. At 1 p.m., Captain Vivian ordered an advance, and we started across country for Jullowallee and Vihowa; we had gone about two or three miles when we met the Naib Thanadar, who brought your letters with the news that you had been rescued. The regiment was ordered back to Meeran, and Captain Vivian and myself, with a small escort of cavalry, rode on to meet you at Jullowallee. On our return next morning to Meeran, I remained with the cavalry as you requested, while you went on to Dera; before we returned all the baggage of the regiment, mess, tent, &c., had come up, and I learnt that this had arrived even before the main body of the regiment had gone back. Five companies of the 4th Punjab Infantry, who had dropped down the river in a boat, arrived at Meeran and reported their arrival on the day we returned. There was a slight difficulty in getting supplies for the troops, but the Mohurir of Meeran, Mahomed Yar, the Daroga of the Government Rukh, Mungut Rai, and the Nawab's agent, Ali Mahomed, exerted themselves, and everything necessary was procured.

The cavalry and infantry remained at Meeran the day after you left, and during the succeeding night, at about 12 o'clock, orders arrived for a troop to proceed to Tibbee: this order was executed and a troop started under the command of Captain Ripley, which arrived at Tibbee, a distance of 28 miles, soon after sunrise. I remained the next day at Meeran with the troops, and on receipt of your letter joined the Commissioner and yourself at Tibbee.

I omitted to mention that Alladad Khan, the Nawab of Dera's eldest son, and Abdool Kureem Khan, Suddoozai, followed us down from Dera and caught us up at Meeran. The old Nawab himself was very anxious to come, as I noticed above, and on being disappointed sent his eldest son and uncle.

(No. 348, dated 21st November 1867.)

From Lieutenant Grey, Officiating Deputy Commissioner *Dera Ismail Khan* to Officiating Commissioner and Superintendent, Derajat Division.

I HAVE the honour to report that, having ascertained during the investigations of bribery cases against Heera Sing, Tehseeldar of Kolachee, that one Khair Shar, who in 1862 was supposed to have accidentally shot himself at Yakooob's well, near Tibbee, with the gun of Jehangir Khan, son of Kowra Khan, Kusranee, Lumberdar of Tibbee, was in fact shot by Jehangir Khan himself, and that, through unsparing bribery, Kowra succeeded in procuring the suppression of the case by the Thanadar, Sultan Mahmood Khan, and the Tehseeldar, Heera Sing. I determined to proceed unexpectedly to the spot and arrest Jahangir Khan, and, sending Kowra Khan and others who were likely to prove obstructive to the inquiry across the river to Leia, to proceed with the investigation in person.

I took Kaloo Khan Bahadoor, Raees of Kolachee, and some sowars as escort in a separate boat, and with my few servants, orderlies, and writers in my own boat, started on the evening of the 9th with the avowed intention of proceeding to Leia to investigate a murder that had occurred there, and intended to land in the early morning at Yakooob's well, which is opposite Leia, and take all parties by surprise, the only way to prevent the absconding of the criminal or the suppression of the evidence. However, it appears that from the time that this crime came out in the Kolachee investigations, Kowra Khan had been warned and advised to protect himself.

The boat containing Kaloo Khan and his sowars fell behind during the night, and towards morning I moored at Futteh Khan to await it. When it appeared in sight, I started again for Yakooob's well, which was about half an hour further down the river; but the river branches at Futteh Khan, dividing upon a long Bela, which at that season (September) was just hidden under water, and by some mistake Kaloo Khan's boat followed the east channel which leads to the left or Leia bank, and even when they found their mistake pursued that course, hoping to be able to get across into the right channel instead of having to track the boat back against the stream; consequently, while I supposed them immediately behind me, and expected them every moment throughout that morning, they did not arrive till late that night.

I landed and at once sent to arrest Jehangir at Tibbee, three miles off, at the same time keeping under my own surveillance Yakooob, who was at his well, and Kowra Khan and his agent, Moosa, who happened to be in the fields of his own well, close by Yakooob's; and I sent on to collect the various witnesses to the murder from the villages round. Meanwhile the day wore, and my guard not arriving, I was unable to send off Kowra, Yakooob, and Moosa, and they also were emboldened by seeing me unprotected, and as evening drew on I saw matters were coming to a crisis. To withdraw from my attempt was a step not to be contemplated; to retain my prisoner and Kowra and the others that I had under surveillance through the night was impossible; so determining to endeavour to carry the matter through, I ordered Kowra and the others to mount, retaining Jehangir, the prisoner, before whom the inquiry must be conducted, and sent them to the boats under charge of the Moonshees and orderlies that were with me, to whom I gave such arms as I had. I remained with a writer and Jehangir Khan, and proceeded with the investigation.

On the way to the boats, Kowra Khan was met by Meerbaz at the head of a score of horsemen, and they all galloped back, accompanied by a large concourse of footmen, and surprised and surrounded me in the village. Their demeanour was at first threatening, but Kowra maintained a tone of respect, merely insisting on the necessity, for his own safety's sake, of my accompanying him to the hills. There was no help for it, so I mounted, and we proceeded to Tibbee, where half an hour sufficed to put all the families and property of the rebels on the road, and we marched through that night, reaching the foot of the hills at moonset, about 3 a.m. There Noor Mahomed, Khutran, was occupying the Bhat pass with a strong gathering, but unfortunately another pursuer, Toda Khan, Dustee, of Bubba, attacked us near the mouth of the pass and turned us off from it; so we slipped in by a small pass which joined it further up and beyond where Noor Mahomed was posted. Kawroo Khan, Khutran, Thanadar of Jullowallee, son of Sultan Mahmood Khan, Chief of Vihowah, arrived about this time and the pursuit was hot; but Kowra Khan, whose arrangements were commendable, kept me in advance and covered the retreat, threatening if brought to bay to kill me first and then sell his life dearly, which threat of course kept the pursuers at a distance. Meanwhile, Mihr Shah, Moorshud of the Belooches, sent to the Boozdars to close the exits from the Kusranee country, and Karreemdad Khan, and Noor Mahomed Khan, Kusranees, and Fuzl Khan, chief of the tribe, and the principal Kusranees of Mungrotah and that neighbourhood joined actively in the pursuit.

Finally, Kowra Khan and his party were brought to bay some 13 miles beyond Bate (a town about three miles within the pass), and, after considerable negotiations with Sultan Mahmood, gave it up as hopeless, and released me in the evening on condition of my people retiring, which we did that night to Littra, whence next day I proceeded to meet Mr. Beckett and the cavalry at Jullowallee.

During the day of course I was hard pressed for terms, but succeeded in turning the

matter off by expressing my conviction that the Commissioner would ratify no conditions that I made, and I made him content himself with a promise to send him all the gram then in his house as otherwise he would starve; also, as he pressed it, that Government should be informed of his contrition; and, lastly, that in the event of Government summoning him for an "anjam" (settlement), that he should have a safe conduct, or that if Government refused, he should be informed. He said that he on his part would commit no "buddi" (mischief).

(No. 379, dated 5th November 1867.)

From Lieutenant *Sandeman*, Officiating Deputy Commissioner *Dera Ghazee Khan* to Commissioner and Superintendent, Derajat Division.

I HAVE the honour, in compliance with your request, to report the manner in which I carried out the instructions received from you from the date of my joining your camp at Vihowa until Kowra Khan and his followers were taken prisoners.

2. At the time I joined your camp, Kowra Khan, with his followers, were believed to be in the Kusranee Hills protected by the hill portion of his tribe. It was your intention to surround these hills by friendly tribes, and, by holding the western passes leading from them, thus prevent Kowra Khan escaping to the countries beyond. By this means he would be held, as it were, a captive by his own people, until they were coerced into surrendering him.

3. To perform this duty, you called out the Oosteranah and other Pathan tribes belonging to the Dera Ismail Khan District, while from Dera Ghazee Khan District several Belooch tribes were summoned to take the field.

4. The Belooch tribes under my orders were to hold the right western passes leading from the Kusranee Hills, while the Pathans held those on the left, thereby entirely encircling the Kusranee Hills. The small rough sketch map enclosed will give some idea of the position the tribes were to occupy.

5. In order to arrange to carry out the part of the duty entrusted to me, I left your camp on the night of the 5th October, proceeding direct to Mungrotah, where I found Jumal Khan, Chief of the Lugarees, Gholam Hyder Khan, Chief of the Loonds, and Ashuk Khan, Chief of the Boozdars, awaiting my arrival. These chiefs had been previously summoned, were anxiously expecting me, and were eager to be set to work.

6. That night I held a long consultation with the three chiefs and their principal head-men, and explained to them very fully your views, and the object with which their men were to be called out. They entirely understood the instructions given them, and by the following evening the whole of the right western passes leading from the Kusranee country were in the possession of our Belooch allies. These consisted of—

1,000 Boozdars, all hill-men.

700 Huddianeas, the hill portion of the Lugaree tribe.

400 Loonds, employed on account of their chief's relationship to the Boozdars;

in all 2,100 men. In order to enable the chiefs to communicate, within a few hours, with me, or I with them, I established a line of runners from their camp to mine, and for the sake of distinction, the chiefs designated their force by the name of the "Army of the South." In writing of it I will also adopt this name.

7. The detailed instructions given to the three chiefs need not be entered upon here. It is sufficient to say they were exactly those directed to be given to them by yourself before I left your camp. They most willingly accepted the trust reposed in them, and individually became responsible for the good conduct of their respective tribes, declaring their ability to exercise entire control over them. That this was no idle boast I shall hereafter fully be able to prove.

8. Having made these arrangements, and having matter to communicate to yourself that did not admit of delay, at the same time that the confederate chiefs bade me adieu to take command of the "Army of the South," I started for your camp, where I arrived at midnight. I may here remark that, to prevent disputes between the three leaders, it was arranged that the votes of any two out of the three as to what was fitting to be done were to carry the day.

9. Regarding the consultation that took place next day with yourself and Captain Grey, and the determination arrived at, it is not my province to enter upon. I will therefore at once proceed to state how I carried out the part you had allotted to me to perform.

10. Amongst other things, it was determined that the young Tomindar of the Kusranees, Fuzl Ali Khan, and his head-men, should be made aware of their responsibilities, and told the necessity that existed of their coming forward for service, and, by aiding the Government in the capture of Kowra Khan and his followers, thereby prove their loyalty. By this means it would be very easily ascertained who amongst the chiefs of the tribe were

were on the side of order, and who were not; in fact, the pulse of the tribe, as it were, would be felt, and its exact state, for good or evil, proved.

11. To do this was considered all the more necessary as Fuzl Ali, the young chief of the tribe (Kowra Khan is only chief of a section of it), had shown evident signs of a desire to do his duty, but was apparently prevented in coming strictly forward to declare himself by the pressure that was put upon him by several of the more influential of the other head men of the tribe.

12. To aid me in carrying out this duty, you were good enough to place at my disposal the whole of the available horse police and levies then in camp, and which belonged to the Dera Ismail Khan District. Mr. Beckett, Assistant Commissioner, Dera Ismail Khan, accompanied me in charge of them. In addition to these, I had a number of my own mounted police; besides, on the road to Kote Kusranee a body of Goorchanee horse also joined me, being then "en route" for my camp. Altogether we were a strong party, and I could name not a few who were good men and true, and to be depended upon.

13. We started about noon, and determined to make Kote Kusranee without delay, as the aid required by the young Kusranee Chief, Fuzl Ali Khan, to be of use, was believed to be emergent. On arrival at the Militia post of Jhoke Boodoo, I resolved, for reasons unnecessary to enter upon here, to take the eight militia sowars composing it with me, and for the time to occupy the post itself with police. As will be seen, this was a very necessary precaution, for I felt the success of our measures on Kote Kusranee depended greatly on their being conducted secretly and quickly, and before the tribe knew what we were about, and to ensure this, nothing possible should be neglected. I may observe here that I at once informed the officer commanding the frontier of the action taken by me in employing the militia; I wanted good guides, therefore their services were really necessary.

14. Hardly had it become known that all the militia sowars at the post were to accompany me, when the non-commissioned officer in command of it came and requested me to allow one sowar, who was sick, to remain behind. I asked to see the sick man, and was taken to a shed, where I saw a man lying apparently very ill. At least such was to be inferred judging from the way he trembled and shook as if in a very severe ague fit. I consulted with Mr. Beckett as to what was to be done, and he arranged to leave a trustworthy man to watch what happened, and to prevent, if necessary, any one going by a near route, unknown to us, to give the alarm at Kote Kusranee of our approach.

15. These arrangements having been made, we resumed our march for Kote Kusranee at a good pace. I may at once dispose of the sick sowar by informing you that it subsequently transpired that, hardly had we left Jhoke Boodoo post, when a lad appeared leading a mare, and at once entered into conversation with the sick man. He was afterwards about to mount and ride off, when he was taken into custody. The sowar is also a prisoner, and will be tried for the offence.

16. On arrival at Kote Kusranee, I was informed by the brother of Tomindar Fuzl Ali Khan, who had seen our approach, and come to meet us, that Fuzl Ali with his headmen, were absent 17 or 18 *koss* off in the hills. He declared that they had been despatched by you on another expedition, with the object of bringing in the families of Kowra Khan and the other fugitives, and had not yet returned. The Tehseeldar of Sungurh, Sultan Mahmood Khan, was also present, and confirmed this story.

17. Strange as it may seem, this statement, although supported by one of our own sub-collectors, who had been placed in the village by me for a certain purpose, was entirely false, for at that very moment, almost the whole of the principal head-men of the Kusranee tribe, both hill and plain, were in the village, and had been holding council together as to the course they should pursue. There was also no room to doubt of this fact being at the time well known to the sub-collector.

18. To enter into detail as to how this came to my knowledge would take up too much time and space; suffice it to say that, before long, Fuzl Ali Khan appeared suddenly before me, coming from the direction of his own house, dressed neatly and with care, his very appearance testifying that many hours must have elapsed since his return from the hills.

19. I felt that the time for trifling had passed, and that the young chief, if chief he wished to remain, must speak out and tell me with what object his brother and the Tehseeldar had tried to deceive me. This to some extent he did, and confessed that not only had he returned from the hills, bringing the families of the fugitives, with the exception of Kowra Khan's, with him, but at that very moment many of the head men of the tribe were concealed in the village.

20. These I at once apprehended, and I found amongst them most fortunately two of the head men of the village of Bhatie, the men of all others who, you are aware, most prominently aided Kowra Khan on his flight to the hills after he had committed the outrage.

21. I next discovered from Fuzl Ali where the rest of his head men were to be found, and started at one and the same time small parties of horsemen under trustworthy leaders,

who were furnished with good guides, to bring them in. All ended successfully, and by night we found we had made since noon a march of 26 miles, and, with the exception of two or three of the hill chiefs, had every Kusranee leader of note in custody.

22. This over, I summoned the Tehseeldar, Sultan Mahmood, to my presence, and required of him an explanation of his conduct. He could give no reply, but remained silent. I put him under arrest, ordering him forthwith to Mungrotah. Subsequently, by your orders, he was sent into Dera Ghazee Khan, and on the option being given him, rather than stand his trial, he resigned the service, his resignation being accepted by you.

23. To the uninitiated, such conduct on the part of a Native officer holding the position and rank of a Tehseeldar, bordering, as it did, on downright treason, must appear inexplicable. To you, who have the key to it, and well know under what powerful influence he acted, it will only occasion regret and not surprise. I therefore leave the matter without further remark, knowing it is not one to escape your consideration.

24. That night I despatched messengers to Mitta Khan, Kaimanee, chief of the hill section of the Kusranees, and directed him and Ahmed of Bhatie to come to me without delay. Next morning Mitta's son arrived, saying his father was sick, which I afterwards found to be true. A few hours afterwards Ahmed of Bhatie also came in.

25. All the head men I then directed should be brought before me, and this having been done, I explained to them the nature of the offence Kowra Khan and his people had committed, at the same time fully informing them of the position they had placed themselves in in having all more or less aided him. I let them plainly see that their doing it, and how it had been done was fully known.

26. After discussing matters with them, they agreed that if Kowra Khan and his party were still in the Kusranee Hills, that they would capture and bring them in; but to do this they would require to call out the army (Luskar) of the tribe. As the capture of Kowra Khan by the Kusranees themselves was, I knew, the very thing you desired, I after coming to a proper agreement with them, consented to the proposal, and, on the whole of the head men swearing on the "Koran" fealty to their young chief, Fuzl Ali, and to aid him in carrying out the duty before him, at his request, and on his security, I set all free, directing them at once to call out their followers.

27. This matter having been accomplished, and having affairs of some importance to explain, I determined to again visit your camp and report progress in person, as what I had to say was hardly of a nature I could well explain in writing. I therefore started for your camp, leaving Mr. Beckett, who had undertaken the task of seeing that the Kusranee Chiefs did not unnecessarily delay in calling out their men, in charge at Kote Kusranee. Before starting, as a matter of precaution, I summoned the troop of cavalry stationed at Fort Mungrotah to Kote Kusranee, and at once informed the officer commanding the frontier that I had done so.

28. On arrival at your camp at Vihowa, the position of affairs, as they then stood, was fully placed before you, and, after discussing them with myself and Captain Grey, I received your instructions to return to Kote Kusranee, and to carry out the proposed measure of, if possible, capturing Kowra Khan and his followers by means of his own tribe.

29. That evening, on my return to Kote Kusranee, I found Mr. Beckett had not been idle, and that most of the chiefs, with their followers, were present. Ahmed of Bhatie was almost the only man of note who had not returned. By daylight next morning he, accompanied by his people, had also returned.

30. That evening, I held a parade of the entire Kusranee tribe, and addressed them, telling them why their chief had been directed to call them out, and the duty upon which they were about to be sent. I explained to them that the capture of Kowra Khan and his followers was essential to free their chiefs from the consequences of having succoured him. Shortly after this the whole party started for the hills, I having placed with them, to give me reliable information of all that went on, Gholam Hyder, son of the well-known chief of the Khosahs, and Jullal Khan, son of the Goorchanee chief. They had each with them a few trusty followers belonging to their respective tribes, and were eager to join in doing service.

31. The Kusranee army was designated for the sake of distinction the "Army of the West," and Tomindar Fuzl Ali Khan had associated with him in command the two young chiefs mentioned in the last paragraph. The responsibility of conducting matters was, as in the case of the confederate commanders commanding the "Army of the south," shared between the three. In like manner, I also opened communications with the "Western Army" by establishing a line of runners from their camp to mine.

32. These plans, to some extent, I communicated to the leaders of the "Army of the South," and directed that, after the Kusranee army had fairly entered the hills, it was for them to make a demonstration, and move their followers as near to the Kusranee country, but without entering it, as possible. This they did, accomplishing it much to my satisfaction. A few of the Boozdars made an attempt at plundering the Kusranee country, which was at once put a stop to, the few animals taken being at once returned to Mitta Khan.

33. After

33. After the departure of the "Western Army," the first day and part of the second passed without incident of any kind happening. About dusk of the second day I received an express from Fuzl Ali, to say that the hiding-place of Meer Bey and his party had been discovered, and that they had been made prisoners, and he was on his way back with them. Later in the evening, the mother of Fuzl Ali sent her second son to me to say that news had reached her from Fuzl Ali to the effect that certain of the head men were not acting in good faith; and she begged of me to send a party to support her son in bringing in his prisoners. I could only send a body of mounted police to the mouth of the pass to support Fuzl Ali on his arrival in the plains, and this I did.

34. About midnight Meer Bey, his son, and several of his followers, were brought in by the Kusranee chief, and handed over to me, captives; their arms, consisting of a double-barrelled rifle and gun, matchlocks, and swords, being placed before me. This capture, next to that of Kowra Khan himself, was the most important one, as Meer Bey was known to be a man of determined courage and character; indeed, it was said that Kowra Khan had committed the outrage principally by his advice. In the morning the prisoners were forwarded to your camp.

35. The next day I again summoned the Kusranee chiefs before me, and this time, from information received from Fuzl Ali Khan, Golam Hyder, and Jullal Khan, I could single out who amongst them were trustworthy, and who were not. The chiefs who were known to be avowedly on Kowra Khan's side, and who had dissented from the capture of Meer Bey, I arrested and placed under a guard, their followers being told that there they should remain until Kowra Khan himself was a prisoner. All submitted quietly enough, with the exception of one or two of the followers of one of the prisoners, who brought their tulwars round to the front, ready for use, but who at once shrunk back into the crowd directly I moved in their direction.

36. The capture of Meer Bey and his followers was in my opinion the crisis of the whole affair. It had the result of showing all that if they desired to take a conspicuous part in the capture of Kowra Khan, they must be up and doing, for I had announced the intention to be that, even if Kowra Khan had escaped beyond the Kusranee border and taken refuge with the Moosa Kheyl, as was reported, the Kusranee tribe would be forced to send a deputation of the head men to demand his surrender to them. As circumstances then were, all knew that it was a measure not unlikely to succeed, especially if the Kusranees themselves desired that it should do so.

37. In pursuance of this, I again directed the Kusranee chiefs still at large to collect their followers, and started them a second time in pursuit of Kowra Khan. This time it was arranged that they should all go direct to Mitta Khan Kaimanee's tower in the hills, and, after consulting together, get his aid in discovering where Kowra Khan was concealed. I had reason to believe that this hill Kusranee chief would now gladly join in getting Kowra Khan made captive.

38. Hardly had the "Western Army" started on their second expedition, when an express arrived from the confederate chiefs commanding the "Army of the South" informing me that they knew for certain where Kowra Khan and his followers were, and that they had sought and obtained a refuge with the Moosa Kheyl. That the Moosa Kheyl were willing to surrender Kowra Khan if a Syud, called Zeman Shah, a spiritual leader of some note in the hills, was sent by them to bring him in. They requested that Fuzl Ali and the leaders of the "Western Army" should stop proceedings until the result of their negotiations with the Moosa Kheyl should transpire.

39. A few hours after receipt of this, a second express arrived from Fazil Ali Khan to say that the Moosa Kheyl were willing to surrender Kowra Khan, but he could not obey my orders and send the deputation of his tribe to bring in Kowra Khan, as the confederate chiefs of the "Southern Army" would not allow the party to pass to the Moosa Kheyl.

40. Shortly after this it also transpired that Ramzan Khan, chief of the Oosteranahs, had proceeded, with your permission, to the Moosa Kheyl country, and was also in treaty for the surrender of Kowra Khan and followers.

41. Fearing the result of so many, in their own interests, pulling different ways, to arrive at the same end, I at once sent an express to Fuzl Ali and Golam Hyder, Khosah, directing them, without hesitation or excuse, which I would not listen to if made, to implicitly obey any order from the three senior chiefs; and at the same time I told the two armies to combine and form one army. I also directed Fuzl Ali to be entirely guided by the elder chiefs regarding the action he was to take in sending the deputation of his tribe to the Moosa Kheyl. This move succeeded admirably, and by return messenger I had the satisfaction to learn that both armies had combined; also that the deputation of the Kusranee chief to the Moosa Kheyl had started, and this, too, with the unanimous concurrence of the chiefs of both armies. All seemed very certain that, within the next few days, Kowra Khan would be a prisoner in the Belooch camp.

42. About this time certain rumours regarding the conduct of Ramzan Khan, Oosteranah, and the intrigues he had set on foot, coming to my notice, I again determined to visit your camp to lay the matter before you. I set out for Reitra, to which place you

had moved; and after again discussing matters, the particulars of which it is unnecessary to enter upon, I received further instructions, and returned to Kote Kusranee in the evening, armed with an order from yourself directing the Pathan chiefs not to interfere.

43. This had the desired effect, and all ended as we anticipated, for very soon afterwards I received an express to say that Kowra Khan had started with the Moosa Kheyl and Kusranee chiefs, and would be made over to the Belooch chiefs. I had previously directed our chiefs to inform the Moosa Kheyl chiefs that, if they also came with Kowra Khan, they would meet with a friendly welcome.

44. Our chiefs met with the Moosa Kheyl chiefs in the Lote country at Unnoo's Tower (the place of meeting is marked in the map), and from that time Kowra Khan was virtually our prisoner. They remained at Unnoo's Tower that night, and the next morning the whole of the chiefs, Pathan as well as Belooch, started in charge of the prisoner for my camp at Mungrotah, where they arrived the following day.

45. The chiefs having taken their places in my tent, I entered and received their respects, thanking them, in a few words, for the service they had performed. The prisoners, Kowra Khan, his son Jehangir, with Yakooob Khan, were then brought in by Povindah Khan, Chief of the Moosa Kheyl, accompanied by the deputation of Kusranee chiefs who had gone to the Moosa Kheyl to request the surrender of the prisoners. This was the first appearance of the Moosa Kheyl and Kusranee chiefs, and it was their evident intention that the two together should deliver to me the prisoners.

46. I welcomed the Moosa Kheyl chiefs, and placed them on my right hand, at the same time directing a place to be cleared in front of me at some distance off, where the prisoners were ordered to sit down.

47. Shortly after this the chiefs took their leave, the prisoners alone being left sitting on the ground. As previously directed by you, I sent to the native officer commanding Fort Mungrotah, and having obtained from him a havildar's party, the prisoners were removed to the quarter guard of the fort. The following morning they were forwarded to your camp in charge of a party of the 2nd Punjab Cavalry.

48. Although I am aware that the excellent spirit displayed by the Belooch chiefs in the way they have conducted themselves throughout this business is known to you, I cannot conclude this Report without bringing the fact myself most prominently before you, for I think it is one we are entitled to congratulate ourselves upon, and I am sure you will feel with me that it is deserving of conspicuous notice.

49. Not only did Jumal Khan, chief of the Lugarees, Golam Hyder, chief of the Loonds, and Ashuk Khan, chief of the Boozdars (the latter an entirely independent tribe, and one that formerly gave much trouble), come forward and actively aid in the capture of Kowra Khan; but it is with the greatest satisfaction I inform you that there was not a single Belooch chief, from the Scinde border in the extreme south to the extreme northern border of the district, who did not come forward and offer his own services and those of his tribe. Old Kowra Khan, Khosah, famous for his loyalty and devotion to Sir H. Edwardes during the time of Mooltan war, sent to say he was too old and frail now to ride a horse, but he had sent his sons and grandsons to do the Government service. In fact, without exception, all were anxious for employment, and while declining their services, as not being required, I heartily thanked them for their offers of service, and assured them that their loyal conduct would be brought by me to your notice.

50. Mr. Beckett, Assistant Commissioner, remained with me up to the close of the proceedings. The service performed by him having taken place under your own observation, it is unnecessary for me to remark upon it. I would not, however, be doing my duty did I not testify to my obligation to him for the assistance rendered, and to my having found in him a valuable coadjutor.

(No. 161, dated 12th February 1868.)

From Under Secretary to Government of India, Foreign Department, to Secretary to Government of Punjab.

IN reply to your letter No. 52-26, dated 11th ultimo, submitting copy of a letter and of its enclosures from the Commissioner of the Derajat Division, reporting on the events attending the seizure of Lieutenant Grey by the Kusranee Chief, Kowra Khan, I am directed by the Governor General in Council to request that the thanks of the Government of India may be conveyed to the several officers whose services are favourably noticed by the Commissioner.

2. The proposal of His Honour the Lieutenant Governor in paragraph 8 of your letter in regard to Allahdad Khan, son of the Nawab of Dera, is sanctioned by his Excellency in Council.

3. I am

3. I am to remark that it would have been well if the reply of the Lieutenant Governor to the Commissioner's letter had been sent, so as to enable the Government of India to see what orders have been issued on the Commissioner's proposals in paragraphs 48 and 49.

4. The map which accompanied your letter is herewith returned.

(No. 162.)

EXTRACT, paragraphs 1 and 2, of the above letter, and of paragraph 8 of the letter to which it is a reply, sent to the Financial Department for information.

(No. 53 of 1868—Political Department.)

The Governor General of India in Council to Sir *Stafford Northcote*, Bart. ;
dated Fort William, 6 April 1868.

To complete the correspondence submitted with our Despatch, No. 36, dated 4th instant, we have the honour to forward copy of a letter from the Punjab Government, enclosing transcript of the orders issued by the Lieutenant Governor on the proposals of the Commissioner of the Derajat, in connection with the seizure of Lieutenant Grey by the Kusranee Chief.

(No. 96-213, dated 5th March 1868.)

From Secretary to Government, Punjab and its Dependencies, to Secretary to Government of India, Foreign Department.

REFERRING to paragraph 3 of your letter No. 161, dated 12th February 1868, I am desired by the Honourable the Lieutenant Governor to forward, for the information of the Supreme Government, copy of the letter No. 53, dated 11th January 1868, to the address of the Commissioner of the Derajat, showing what orders have been issued by the local Government on the Commissioner's proposals in connection with the seizure of Lieutenant Grey by the Kusranee Chief.

(No. 53, dated 11th January 1868.)

From Officiating Secretary to Government, Punjab and its Dependencies, to Lieutenant Colonel *Graham*, Officiating Commissioner of the Derajat Division.

I AM directed by the Honourable the Lieutenant Governor to acknowledge receipt of your letter No. 156, dated 9th December, reporting your proceedings in the case of Kowra Khan; and, in reply, to send, for your information, copy of a letter No. 52-26, this day addressed to the Secretary to the Government of India in the Foreign Department.

2. I am to convey to you the very hearty acknowledgments of the Lieutenant Governor for the ability with which you have brought to a successful conclusion a very delicate matter, and converted what might have led to disastrous results into a means of greatly improving our relations with the frontier tribes.

3. I am also to request that you will convey to Mr. Beckett the acknowledgments of the Lieutenant-Governor for his services on this occasion; and the Lieutenant Governor's cordial thanks to Lieutenant Sandeman, to whose influence over the Kusranee and Belooch-tribes, and activity in carrying out your plans, the success of the operations is in no small degree due.

4. the thanks of the Lieutenant Governor will be communicated to Colonel Hood and Captains Vivian, Keene, and Ripley, through General Wilde.

5. The Lieutenant Governor approves and sanctions the distribution of the reward of 10,000 rupees which you made, and the grant of a khillut of 3,000 rupees to Nawab Surfuraz Khan. The khilluts, costing 5,400 rupees, which you distributed, are also sanc-

tioned, and may be charged to Government as you propose. The reward of 10,000 rupees and the expenses of the force, amounting to 15,000 rupees, should be charged to the Kusranee tribe, the further fines on whom will probably fully cover the value of the khilluts given by Government.

6. You may assure Allahdad Khan that the Lieutenant Governor hopes to be able ere long to give him a trial in the public service.

7. Complimentary letters for Nawab Surfuraz Khan and for the other chiefs named in your 52nd paragraph are herewith enclosed.

8. The arrangements made for leaving a temporary guard at Vihova and Mungrota are approved.

9. With regard to the prisoners in custody, you should detain only those who were actively concerned in carrying off Lieutenant Grey, or in aiding and abetting the offence; and if any women and children are in custody (paragraph 37 of your Report), they should be set at liberty. You are also requested to report for information the sentences eventually passed on the prisoners.

(No. 83.—Political Department.)

Sir *Stafford Northcote*, Bart., Secretary of State for India, to the Governor General of India in Council; dated 15 May 1868.

1. I HAVE considered in Council the letters of Your Excellency's Government in the Foreign Department, Nos. 175 of 7th December, 1867, 36 of 4th March, and 53 of 6th April 1868, respecting the seizure of Lieutenant Grey, the deputy commissioner of Derajat, by Kowra Khan, Kusranee, and his subsequent release, under pressure, by the adjoining tribes.

2. I observe with regret that the conduct of Lieutenant Grey, who is described as possessing many admirable qualifications for his present post, was, in this instance, characterised by an amount of rashness, such as to call forth the just censures of the Lieutenant Governor of the Punjab, which were concurred in by Your Excellency's Government. His subsequent firmness in refusing to offer or accept any terms for his release, is greatly to be commended; and I trust that the results of his indiscretion in this instance, will serve as a useful lesson to him, and render him more cautious in his future operations.

3. The arrangements of Lieutenant Colonel Graham to ensure the extradition of Kowra Khan, by means of the pressure brought to bear on the offending tribe by their neighbours, have been eminently successful, and reflect high credit on the tact and ability which have given that officer so decided an ascendancy over the wild clans, with whom he has been brought into contact.

4. I approve the rewards granted by you to the chiefs of the deserving tribes.

EAST INDIA (LIEUTENANT GREY).

COPY of DESPATCHES from the Government of *India* in Political Department, dated 7 December 1867 (No. 175), and in March 1868 (No. 36), with Enclosures, relative to the Seizure of Lieutenant Grey by *Kowru Khan*, a Belooch Chief.

(*Sir Stafford Northcote.*)

Ordered, by The House of Commons, to be Printed,
19 May 1868.

285.

Under 3 oz.

EAST INDIA (IRRIGATION).

RETURN to an Address of the Honourable The House of Commons,
dated 18 February 1868;—for,

“COPY of a DESPATCH from the Government of *India*, dated the 16th day of July 1867, recommending that an Offer be made to Purchase the WORKS of the EAST INDIA IRRIGATION COMPANY in *Orissa*.”

India Office, }
18 February 1868. }

W. T. THORNTON,
Secretary, Public Works Department.

(No. 114.—Public Works.)

Government of India.—Public Works Department.

IRRIGATION.

To the Right Honourable the Secretary of State for India.

Sir,

Simla, 16 July 1867.

RECENT events in Cuttack have led us to reconsider the probable results that will follow if the prosecution of the irrigation works in that and the neighbouring districts continues in the hands of the East India Irrigation Company.

2. The Government of India for the last three or four years has, at various times in its correspondence with the Home Government, expressed its opinion that the State should undertake directly all irrigation works that it can practically manage, in preference to entrusting them to private Companies. This conclusion has rested on the conviction that the interests involved in the application of water to the irrigation of the soil are so complicated that it becomes almost indispensable that the Government should exercise over Companies entrusted with irrigation works a control little short of absolute. It would be exceedingly difficult so to frame any agreement between such a Company and the Government as should at the same time effectually secure this control and satisfy the Company, which has a right to look for ample returns on the capital invested by them; and it would be hardly less difficult to enforce the necessary control, even if the clauses of the agreements could be effectively framed.

3. We can say, without any hesitation, that almost every communication that has passed between our Government and the Government of Bengal, or the Agent of the East India Irrigation Company, relative to the affairs of this Company, has served to give practical confirmation to the conclusions which, as above explained, we had before adopted on a general consideration of the probabilities of the case. There is hardly any single question which has thus arisen for discussion which has not been complicated, and its difficulties sensibly increased, beyond what it otherwise need have been, owing to the intervention of the Company between the Government and the community occupying the districts in which the Company's operations are undertaken.

4. In making these remarks nothing is further from our wish than to imply that the Company's officers have taken up any position which they were not fairly entitled to take up, or which it was not reasonable to expect that they might take up, having regard to the relation which they occupy as representatives of the Company, and as being bound by their sense of duty to attend first to what they deemed to be the legitimate interests of the Company. Our conten-

tion is, that in the very nature of the agreement entered into between the Company and the Government, great difficulties must be and are engendered in all important questions that have to be dealt with in relation to the prosecution of the Company's works and the extension of irrigation to the country.

5. You are aware that, notwithstanding the strong opinions which we hold as to the inconvenience of the arrangement that has been entered into with the Company, it has been our earnest wish to do all in our power to facilitate the operations of the Company, and to act fully up to the spirit of any actual, or implied engagements entered into with them in past years. If it be necessary to adduce any distinct proof of this disposition on the part of the Government of India, we would refer to our recent resolutions to entrust to this Company the execution of the Soane Canal project, and to make grants of money to aid in the construction of the works in Cuttack, the Company's funds having proved insufficient to secure their prosecution with that activity which, in the altered condition of this province, we deem so desirable. And we may assure Her Majesty's Government that it will continue to be our desire to act in this same manner so long as the present arrangements between the Government and the Company shall be maintained.

6. But the terrible calamity which has recently fallen on Orissa and Western Bengal has forced upon us the consideration of the question, whether we can any longer with propriety permit the existing arrangements to continue in force, if it be possible to induce the Company to give up their rights under their contract.

7. So far as any mere inconvenience to ourselves and our officers is concerned, though it is not without serious importance, yet it would not alone have led us to think of any such contingency as that which we have just spoken of. Had we therefore been disposed to think it likely that the further prosecution of the irrigation works undertaken by the Company, and their future practicable operation, would really go on in a manner which should be satisfactory to the country, we should have continued to do our best in giving effect to the agreement with the Company, without remonstrance or attempt to free ourselves from the burden it imposes upon us.

8. But in no respect can we look forward hopefully to the prospect before us if the contract is maintained. It is apparent that the financial means of the Company are not equal to the demands which the present necessities of the country so urgently require to be met. At the meeting of the shareholders of the Company in November last the chairman stated that the Directors had found it necessary and expedient to reduce the amount of outlay on the works, with the object, as it is understood, of waiting to see what would be the financial results of the portion of the works already executed before extending them further. Nor, so far as we are able to judge, is there any reasonable prospect of the resources of the Company being enlarged in the present condition of the money market either in this country or in England. The shares of this Company have long been at a considerable discount, and it is pertinent to remark that the stock of the Madras Irrigation Company, though carrying a guarantee of five per cent. interest, is also at a small discount, plainly showing the disfavour in which such enterprises are now viewed in London. As to the future, the probable requirements of the Government of India for works of irrigation, and those of the guaranteed railways, will give the public the means of investing their money on terms more favourable than those offered by the East India Irrigation Company; and it may, we think, fairly be doubted, therefore, whether that class of investors which is disposed to place its funds in Indian securities will have any appreciable balance left for investment in an unsecured stock already at a discount, after the demands for subscription to Government and guaranteed stocks shall be fully met.

9. In further illustration of the difficulties with which the Company has to contend, we may mention the unwillingness of the people to take the water at present. It will probably require time, and a lowering of the price of water before this unwillingness will be overcome; and meanwhile the Company will not receive the profits which were looked for, nor obtain an adequate return for its outlay. This state of things may last for years, and the Company cannot

not apparently afford to wait for its returns. To the Government, on the other hand, the question of immediate return for the outlay is of less importance. Once assured that there is a reasonable prospect of an adequate return eventually, the Government can afford to wait till the people learn to use and to value the water and to pay for it accordingly. It is true that at the meeting of the shareholders in May last a disposition was shown to push on the works, but this was apparently only rendered practicable by the financial aid afforded by our Government.

10. We entirely disclaim the intention of making any reflection on the Company for the manner in which their operations have been hitherto carried out, or for the mode in which they have raised or applied their capital. It is incontestable that a large sum has been raised and spent, and it is even probable that had the Company not come forward, the Government would, up to the present time, have done much less than has been done towards the construction of irrigation works in Cuttack. But the position of the Government with relation to the execution of irrigation works has, within the last year, become entirely changed, and our business is no longer with the past but with the present, and the immediate future, and it is impossible for us to avoid the conclusion that, for the reasons we have above given, the means of the Company henceforth will not only be relatively far inferior to those of the Government, but absolutely insufficient for the real necessities of the country.

11. In truth this is already the case in a marked manner, and so far from the Company any longer being the medium by help of which funds are supplied to the State for these works, it is the Government which now supplies the Company, and a monthly subsidy of 20,000 *l.* from the Government Treasury gives them the means of carrying out their undertaking with an energy in some degree commensurate with its true importance.

12. Having weighed these considerations, and those arising from the complications already caused in adjusting the demands of water rate and land revenue, we have felt it to be our duty to suggest to you that a proposal should be made to the Company to give up the undertaking to the Government of India, the Company receiving in return full indemnification for all past outlay, and a fair compensation for future possible profits.

See Report lately made to H. M. Government, in the Revenue Department

13. In considering the exact terms that may be offered to the Company, we are inclined to err on the side of liberality. It is very important that if the existing engagements are terminated, this shall be done in a manner that shall command good feeling towards the Government on the part of the shareholders and officers of the Company.

14. The Government of India is aware on the one side, that a sensible portion of the capital of the Company has been appropriated to the payment of interest to the shareholders, that the existing stock is at a discount, and that the prospects of profits from the spread of irrigation are uncertain. On the other hand, they do not overlook that the shareholders have invested their capital in good faith, with the reasonable expectation of securing at least a fair return upon it, and with some prospect of that return being large; that the Company has thus far carried out its operations with all proper regard to its obligations; that there are in the service of the Company many persons who naturally and fairly have looked upon their offices as likely to be lasting, and to afford them a provision which, if not permanent, was at all events certain not to be soon stopped.

15. On the whole, therefore, we are inclined to suggest the following terms for your consideration:—

First. The whole paid-up capital of the Company to be converted at par either into five per cent. debentures of the Government of India, repayable at par in 60 years, or into terminable annuities, which we consider the preferable mode of conversion; or, if such an arrangement would prove more acceptable to the shareholders, we would propose to convert the capital partly in the one way and partly in the other.

Second. The whole of the cash balance, and of the liabilities and claims of the Company, to be transferred to the Secretary of State; the liabilities to be declared previous to the transfer, and accepted by an officer or officers of the Government after due scrutiny.

Third. The whole of the works and stores of the Company, and all their property, whether in England or India, to be transferred to the Secretary of State, with all papers and accounts connected with the undertaking.

Fourth. The Government of India to take into its service, provisionally, all persons now employed by the Company in India on the works or business of the Company, from the date of the transfer taking place, who may express their wish to enter the service of Government, and to declare, as early as possible afterwards, whom among them it does not wish to retain in its service. To all persons in permanent employ not retained in the service of the Government, a sum equal to six months' salary shall be paid as compensation to natives of India, and as affording to Europeans the means of returning to their homes. In the case of engagements for limited periods, compensation will be allowed according to the merits of each case.

Fifth. The Government of India shall pay to the Company all their expenses connected with the Soane project, and 10 per cent. additional to cover interest.

Sixth. A further sum of 50,000*l.* shall be placed at the disposal of the Board of Directors of the Company, either in cash or in Five per Cent. Debentures, or in Terminable Annuities, as above, as they prefer, to allot at its discretion as a bonus to the shareholders on the abandonment of the Orissa and Soane concessions, and as compensation to the officers of the Company, especially those in England, who lose their posts under these arrangements.

Seventh. The Company then shall relinquish entirely all its claims in respect both to the Orissa project and the Soane project.

16. We submit for your consideration that these terms will contain an equitable offer to the Company neither unduly onerous on the finances of India nor going beyond a reasonable compensation to the shareholders, while they are conceived in a due spirit of liberality and with an anxious desire to prevent any personal injury arising to the servants of the Company.

17. In ordinary cases it would be proper, before making such a proposal as we have now brought forward, to obtain an accurate, or at least an approximate, valuation of the works which the Company has constructed, and which the Government is to take over. In the present case, however, we attach so much importance to the early settlement of the matter, that we are disposed to forego making any conditions with the Company as to the value or state of the works. Any such conditions would probably lead to discussions and delay; and we prefer to run the risk of some over-payment for the works rather than continue longer the present unsatisfactory relations with the Company.

18. We may mention, however, that the works have been visited by Colonel Morton, R. E., an officer of great experience in irrigation works, and also by Colonel Nicolls, R. E., the Chief Engineer of Bengal. Both these officers, and also Mr. Crommelin, the Superintending Engineer in the service of the Government at Cuttack, agree in stating that the works are good. These statements have not been made on any critical examination nor in any official report; but we are satisfied that in a general way they are correct. In the same way we learn that in point of actual cost, that is, of the actual outlay upon the works themselves, they are cheap. So far, then, we have some grounds for believing that the Government would not pay any extravagant sum in taking over the works as proposed. But there is a further consideration as to the cost of the works in regard to which we are not satisfied. This is, the charges which they have to bear in addition to the actual cost of construction, owing to the other expenses of the Company, which must be regarded as charges upon the works if they are taken over, by accepting the Company's entire outlay of capital. We have no precise information on this point; but the general impression derived from their inspection by the engineers we have just named was that the works could have been constructed by the Government Public Works Department, including the cost of establishment and all other charges, for considerably less than the capital outlay of the Company. It is probable then, on the whole, that the works, if taken over in the manner we propose, will not in themselves be cheap to the Government. But this risk, as before said, we are prepared to accept, in consideration of the important advantages of getting rid of so unsatisfactory an agency for future constructions of this kind.

19. And, after all, the amount to be risked is not great, if compared with the object in view. By the last reports we possess, the entire amount of capital raised by the Company is 719,088. *l*; adding the 50,000 *l*. we propose to give them as a bonus, the amount becomes 769,088 *l*., which, at five per cent., represents an annual charge to the State of 38,454 *l*., or about four lakhs. This sum is susceptible of slight increase from the repayment of the expenses of the Company connected with the Soane project (for which, however, there will be a certain value received) and from outlay incurred by the Company since the date of the last returns. But allowing for this, the annual charge we are likely to incur (assuming that the capital and bonus are converted into debentures) will not exceed 45,000 *l*., or 4½ lakhs; and this, we have no doubt, will eventually be more than covered by the profits of the irrigation, so that we expect the proposal we now make will in the end prove financially advantageous, as well as greatly beneficial in all other points of view.

20. We have been informed by telegraph that the Lieutenant Governor of Bengal concurs generally in the above proposals.

We have, &c.
(signed) *John Lawrence.*
W. R. Mansfield.
H. S. Maine.
G. N. Taylor.
W. N. Massey.
H. M. Durand.
G. U. Yule.

EAST INDIA (IRRIGATION).

COPY of a Despatch from the Government of
India, dated 16 July 1867, recommending
that an Offer be made to Purchase the Works
of the EAST INDIA IRRIGATION COMPANY in
Orissa.

(*Sir Stafford Northcote.*)

Ordered, by The House of Commons, to be Printed,
20 February 1868.

EAST INDIA IRRIGATION COMPANY.

RETURN to an Address of the Honourable The House of Commons,
dated 6th July 1868 ;—for,

“COPY of any further DESPATCHES, TELEGRAMS, and LETTERS between the Secretary of State in Council and the Government of *India* respecting the proposed PURCHASE of the WORKS of the EAST INDIA IRRIGATION COMPANY, or the ADVANCE of FUNDS for the WORKS thereof since July 16, 1867.”

India Office, }
9th July 1868. }

W. T. THORNTON,
Secretary, Public Works Department.

TELEGRAM from the Governor General to the Secretary of State, dated
17th September 1867.

GOVERNMENT is advancing about 20,000 *l.* per month for Orissa works. The Irrigation Company should, if possible, be prevented from applying any funds to Soane project until they have supplied all wants of Orissa, and have relieved Government from necessity of making further loans.

PUBLIC WORKS DESPATCH from the Government of *India* to the Secretary of State, dated 21st September (No. 167), 1867.

Sir,

THE Governor General's telegram of the 17th instant was despatched to you in consequence of the receipt from the Government of Bengal of a letter (No. 115 L., dated 30th August) regarding the loan which the East India Irrigation Company has received and is continuing to receive from our Government to assist in carrying out the works of the Company in Orissa.

2. The Lieutenant Governor of Bengal having asked the agent of the Company what sum was likely to be required by the Company for the future, a reply was received that the Company would wish to borrow from the Government in all a sum of 320,000 *l.*, which is the limit of the borrowing powers of the Company under its Act of incorporation.

3. The reply of the agent leaves us in some doubt whether the Company looks to the Government to supply in this manner the whole of the money needed for its operations in Orissa, or whether the Government loan will be an addition to a further sum to be supplied from the Company's own resources. But we are inclined to think it at least possible that the former is the real intention. Lieutenant Colonel Rundall, who of course has an intimate knowledge of the affairs of the Company, speaks of the sum of 320,000 *l.* as likely to suffice till the end of the working season of 1870, that is, for four years, including the current year. This would be at the rate of 80,000 *l.* per annum. In the present season, it is understood that about 100,000 *l.* or 120,000 *l.* will be advanced by the Government.

4. The question which we now have to consider is, whether the Government should continue to supply this Company with funds to so large an extent, after the expiry of the present season, to which the original offer of assistance exclusively applied. We have no difficulty in adopting the conclusion that so far as money is really essential for the vigorous prosecution of the works of the Company, it will be our duty to supply it, even if the result be to place the Government in a still more disadvantageous position in relation to the Company than that which it already holds. The Government of India has incurred obligations to the province of Orissa which must be fulfilled.

5. So long as this Company is in possession of the exclusive right to carry out irrigation works in Orissa, which virtually is the case now, whether it is unable to provide funds for this purpose, or refuses to provide them, the result, as far as the Government of India is concerned, seems to us the same. That result is that the Government of India must in such a case provide the funds itself. How embarrassing a position this is for the Government to find itself in, it is needless for us to say; but it would be idle to attempt to shut out the truth.

6. It further becomes necessary for us to observe that the position of the Company in relation to the Soane project brings an additional element of difficulty into the mode of dealing with the matter before us. It seems not at all improbable that the Company may take advantage of the assistance which it has received from the Government for the Orissa works, and the presumed readiness of the Government to continue that assistance, to withdraw all its available means from that project, and to throw them into the fund for prosecuting the Soane project. If the Company pleases to act in this way it seems almost impossible for the Government in its present position as regards Orissa to apply any efficient remedy.

7. The only course, then, that seems to us open is that Her Majesty's Government should, as suggested in the Governor General's telegram, use what influence they can to induce the Company to apply all its available means faithfully to carry out the works in Orissa, at least to the extent to which they have asked the Government of India for assistance, that is, to apply 320,000 *l.* (including the advance made by the Government) up to the end of the working season of 1870. Any sum which they may raise in excess of this could reasonably be applied to the Soane works. But we feel strongly that if money is raised by the Company, and not first applied to the Orissa project, to the extent above named, an undue advantage will be taken of the Government, and that the Company should be informed that such is the deliberate opinion of the Government.

8. We can only further say that if the Company should not act in this matter in accordance with what (on such further consideration of the facts as Her Majesty's Government shall think proper to give), seems to be just, we shall feel ourselves bound to take every step which can be taken consistently with the strict terms of the agreements between the Company and the Government towards the putting an end to the Company's operations, both in Orissa and on the Soane.

9. We trust that some more satisfactory way out of this difficulty may be found than at present seems likely, and we shall be glad to be informed at the earliest possible date of the conclusion which Her Majesty's Government may arrive at on the subject.

We have, &c.

(signed) *John Lawrence.*
W. R. Mansfield.
G. N. Taylor.
W. N. Massey.
H. M. Durand.

TELEGRAM from the Governor General to the Secretary of State, dated
30th September 1867.

SEE our Public Works Despatch No. 114, of 16th July last.

Please inform me, by telegraph, if what is proposed in regard to the Irrigation Company is likely to be carried out.

TELEGRAM from the Governor General to the Secretary of State, dated
30th January 1868.

I HOPE you will not give the East Indian Irrigation Company a guarantee for any part of their capital. Any payment in moderation which is really necessary to induce them to sell is preferable; a guarantee would only add to our complications.

PUBLIC WORKS DESPATCH from the Government of India to the Secretary of State, dated 10th March (No. 38), 1868.

Sir,

WITH reference to your Despatch No. 32 of the 8th April 1867, we have the honour to forward a memorandum of the advances made to the East India Irrigation and Canal Company to the end of 1867, showing the dates on which the several amounts were placed at the credit of the Company in the Bank of Bengal.

We have, &c.
(signed) *John Lawrence.*
W. R. Mansfield.
G. N. Taylor.
W. N. Massey.
H. M. Durand.
H. S. Maine.
John Strachey.

MEMORANDUM of Advances made to the East India Irrigation and Canal Company.

Dates on which the several advances were placed at credit of the Company in the Bank of Bengal.							Amount.
							<i>Rs.</i>
18th February 1867	-	-	-	-	-	-	2,00,000
27th March	„	-	-	-	-	-	2,00,000
25th April	„	-	-	-	-	-	2,20,000
1st August	„	-	-	-	-	-	2,00,000
31st October	„	-	-	-	-	-	1,00,000
November	„	-	-	-	-	-	—
December	„	-	-	-	-	-	—
TOTAL - - - <i>Rs.</i>							9,20,000

PUBLIC WORKS DESPATCH from the Secretary of State to the Government of India, dated 1st May (No. 49), 1868.

Para. 1. YOUR Excellency's Despatch No. 38, of 10th March last, forwards a memorandum showing the advances made in the course of last year to the East India Irrigation and Canal Company, to assist them in carrying on their works in the province of Orissa.

2. I am in doubt whether any similar advances have been made since the beginning of the present year. In any case, I request that none may be made after this Despatch reaches you.

(signed) *Stafford H. Northcote.*

TELEGRAM from the Secretary of State to the Governor General, dated 1 May 1868.

MAKE no more advances to Irrigation Company on account of Orissa works.

PUBLIC WORKS DESPATCH, from the Secretary of State to the Government of India, dated 15th May (No. 53), 1868.

Sir,

1. HEREWITH is transmitted, for your Excellency's information, copy of a letter, dated 6th instant, from the Directors of the East India Irrigation and Canal Company, wherein it is stated that pending the non-completion of the supplementary amending contract, "surveying operations and the planning of the work in detail have been carried on in Behar, and lately continued at the express request of the Government of India, and that these proceedings are still in progress."

2. I wish to be informed what are the precise operations which are thus alluded to as being carried on at your express request. For several months past negotiations have been pending between this office and the Company with a view to the transfer by the latter to your Government of their Behar project. As yet, however, there is no appearance of these negotiations being brought to a satisfactory close, I should be glad, therefore, to know what is the present state of the Company's operations, and what power you consider yourselves to possess under the contract of resuming the concession made to the Company in respect of their Behar undertaking.

(signed) *Stafford H. Northcote.*

LETTER from the East India Irrigation Company referred to in the foregoing Despatch.

8 and 9, Queen-street Place,
6 May 1868.

Sir,

REFERRING to my letter of the 9th October 1867, relative to the construction of works of irrigation in Behar by this Company, and especially to paras. 14 to 21 thereof, both inclusive, I have, by request of the Board of Directors, to inform you that, on the 4th December last, the Company's manager in Calcutta received from the Government of India an engrossment in duplicate of the supplementary amending contract then mentioned, executed by the Government of India, which deed was received by the Board in January last, but, upon reading its contents, it appeared that a serious but unintentional inaccuracy existed in the language of one of its clauses, and on the 18th February last it was returned to India for re-submission to Government for amendment.

amendment. No reply has yet been received from the latter, and the directors have, therefore, thought it right to inform the Secretary of State in Council of the exact state of the matter for his information. I am desired to add that, pending the non-completion of the foregoing deed, and in anticipation of the Company's action thereunder, surveying operations and the planning of the works in detail have been carried on and lately continued at the express request of the Government of India, and that these proceedings are still in progress.

(signed) *J. Westwood.*

The Under Secretary of State for India.

TELEGRAM from the Governor-General to the Secretary of State, dated
3 June 1868.

WITH the concurrence of my Council, I have sanctioned the advance of one lac to the Orissa Irrigation Company, and you are requested to allow a second lac: the reason will be gathered from the following telegram from Lieutenant Governor of Bengal: "Very urgent:—Mr. Levinge has this telegram, dated 20th May, from London. Entreat Governor to continue advance temporarily to prevent lamentable stoppage of work. Capital being raised, but cannot send remittance this or next month. Mr. Levinge begs for one lac for June, and same for July. He says, if not granted, work must stop. Loss will be incalculable. Much suffering will ensue from sudden discharge of 18,000 men." I recommend advance. Commissioner telegraphs, that if irrigation works are stopped it will cause great loss to the Province.

TELEGRAM from the Secretary of State to the Governor General, dated
12 June 1868.

ADVANCE of two lacs to Orissa Company sanctioned. Advance no more without reference home.

EAST INDIA IRRIGATION COMPANY.

COPIES of further DESPATCHES, TELEGRAMS, and
LETTERS between the Secretary of State in
Council and the Government of *India*, respecting
the Proposed PURCHASE of the WORKS of the
EAST INDIA IRRIGATION COMPANY, or the
ADVANCE of FUNDS for the WORKS thereof, since
July 16, 1867.

(*Mr. Bouvierie*).

*Ordered, by The House of Commons, to be Printed,
10 July 1868.*

EAST INDIA (LADAKH).

RETURN to an Address of the Honourable The House of Commons,
dated 5 March 1868;—for,

“ COPY of CORRESPONDENCE between the Secretary of State for *India* and
the Governor General in Council, relating to the Appointment of a
COMMERCIAL AGENT in *Ladakh*, and to his Proceedings there.”

India Office, }
12 March 1868. }

J. W. KAYE,
Secretary, Political Department.

(*Lord William Hay.*)

Ordered, by The House of Commons, to be Printed,
16 March 1868.

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COPY of CORRESPONDENCE between the Secretary of State for *India* and the Governor General in Council, relating to the Appointment of a COMMERCIAL AGENT in *Ladakh*, and to his Proceedings there.

(No. 40.—Foreign Department—Political.)

The Governor General of India in Council to Viscount *Cranborne*, Secretary of State for India; dated Fort William, 23rd February 1867.

IN continuation of our Despatch, No. 164, dated 8th October last, regarding the exactions of Cashmere officials on British traders in Ladakh, we have the honour to transmit, for the information of Her Majesty's Government, copy of a further correspondence with the Punjab Government, from which it will be seen that we have sanctioned the deputation, as an experimental measure, of an English officer to Ladakh. The first duty of this officer will be to secure the observance of the Customs Tariff fixed by the Maharajah of Cashmere in 1864; but he will also be instructed to obtain as much information regarding the trade and politics of Central Asia as may be available.

2. Further, upon the representations of the Punjab Government as to the inadequacy of the emoluments enjoyed by the Native Official who superintends the neighbouring British District of Lâhoul, we have taken this opportunity to raise the allowance of the Negee of Lâhoul to 550 rupees per annum.

From *T. H. Thornton*, Esq., Secretary to Government of the Punjab, to *J. W. S. Wyllie*, Esq., Officiating Secretary to the Government of India, Foreign Department, Calcutta (No. 534-2514); dated Lahore, 13th December 1866.

I HAVE the honour to acknowledge the receipt of your Despatch, No. 930, dated 10th September 1866, conveying an expression of the views of the Right Honourable the Governor General in Council regarding the obstacles placed on the development of trade with Central Asia by the exactions of the Ladakh officials, and regarding the levy by them of a money contribution from the people of the British district of Lâhoul.

2. In reply, I am desired by the Honourable the Lieutenant Governor to intimate, for the information of the Right Honourable the Governor General in Council, that the Maharajah of Jummoo and Cashmere has been addressed upon the subject, and has promised to make a searching investigation into the complaints made against the conduct of the Ladakh officials, the result of which will be reported hereafter.

3. With regard to the measures to be taken by this Government to secure the due enforcement of the tariff of duties agreed to by his Highness in 1864, I am desired to state that, during the latter part of the past hot season, a news-writer was deputed by this Government to Ladakh, partly for the purpose of collecting information regarding events in Eastern Turkistan, and partly with a view of reporting whether the terms of the agreement above-mentioned were properly carried out, and with that view he was furnished with vernacular copies of the schedule of duties agreed upon.

4. It may be desirable to depute a news-writer to Ladakh next season also, and in that case his Hon. G^d proposes to place that official in communication with the Assistant Commissioner in charge of the subdivision of Kulu, who will for that period be located in Lâhoul; and his Honor would further recommend that he be empowered, should he think fit, and notwithstanding the distastefulness of such an arrangement to the Maharajah, to depute an Assistant Commissioner, specially selected for his fitness for the post, to remain at Ladakh during the next hot season and rains to protect the interest of traders, and report upon the measures which may be best calculated to develop trade between the regions beyond Leh and British India. The arrangement will cause no extra expense to the State beyond the usual deputation allowance of five rupees per diem.

5. With regard to the levy by the Maharajah of a contribution of 164 rupees per annum from the people of Lahoul, I have the honour to report that the levy of that contribution has now ceased; and with reference to the position and emoluments of Tara Chund, Negee of Lahoul, adverted to in paragraphs 7 and 8 of your Despatch, I am desired to submit the accompanying extracts of correspondence,* and to remark thereon as follows:—

6. Tara Chund having been strictly prohibited for the future from receiving any allowance from the Maharajah, there can, in his Honor's opinion, be no doubt whatever that the income which will then remain to him is wholly insufficient to enable him to maintain the position which he ought to hold; and notwithstanding the comparatively insignificant character of the tract, the responsibilities devolving on the head of the Lahoul pergunnah, owing to its secluded position, are really very considerable; and all concurrent testimony shows that he fulfils them in a very commendable manner, so that he is deserving of much consideration personally, while his office stands in need of substantial support.

7. Elsewhere in the Punjab it has been a common practice with former rulers, and their practice has been in some instances followed by ourselves, to allow to influential chiefs, as a reward for their services and to secure their loyalty, one-fourth of the revenue of the tract over which they preside; and it would, in his Honor's opinion, be in every way more appropriate to extend this principle to Tara Chund and his successors, should they prove themselves worthy of the grant.

8. The revenue of Lahoul is at present but 2,200 rupees per annum; the Lieutenant Governor would accordingly recommend that, without interfering with the small jaghire which Tara Chund holds, one-fourth of this, or 550 rupees per annum, be granted him in lieu of his present allowances. The sum is a small one for the Government to surrender, but it would suffice to satisfy the Negee's aspirations and place him above the necessity of looking elsewhere for a provision. It would evince to the people of Lahoul the consideration in which Tara Chund is held by the Government, and would ensure for the post he holds that respect which he at present secures by his own personal qualities, while a percentage of this kind would give him a direct interest in increasing the productiveness of the tract.

EXTRACT, Paragraphs 39, 40, and 41, of a LETTER from *T. D. Forsyth, Esq., C.B.*, Commissioner and Superintendent, Jullundhur Division, to *T. H. Thornton, Esq.*, Secretary to Government of the Punjab (No. 187); dated 23rd July 1866.

Tara Chund's Jaghire.—Tara Chund enjoys a jaghire of 134 rupees as Negee of Lahoul, and 100 rupees per annum as honorary magistrate. He is a man universally respected, and possesses letters from numerous European officers, all of whom speak of him in the highest terms. From the missionaries I hear that he rules with consideration for the people, is very hospitable and generous; but unfortunately his means are small, and quite inadequate to meet the demands of his position. He occupies an important place, looking at it in a political view. His countrymen are the great traders between British territory and Ladakh and Yarkand, and it makes a material difference to them whether their own chief is on friendly terms or the contrary with the rulers of the foreign countries into which they penetrate. Thus, Tara Chund is ever ready to give a friendly reception to any of the Ladakh officials or influential natives of the Thibetan countries who visit Lahoul, and in various ways he has incurred heavy expenses, which he can ill afford, in order to keep up the trade between his country and Thibet. On this subject of trade I shall treat hereafter; at present I merely record the fact of Tara Chund's liberality at the expense of his pocket.

40. He was supposed by Mr. Jones to have considerable perquisites, but the result of further inquiry, confirmed by the opinion of Mr. Heyde, shows that Tara Chund derives very little income from the cesses on ponies, sheep, &c., which the Government have been pleased to continue to him for his life.

41. The revenue of his province is insignificant, only 2,200 rupees per annum, and if it be taken into consideration, I fear the Government would not be disposed to increase his allowance; but if we look at the case in a political light, and consider the advantage to be gained by advancing our influence and our trade beyond Hinalaya into Central Asia, I think our object would be furthered by improving the position of our representative in the frontier province of Lahoul. If, therefore, Tara Chund's allowance cannot be increased, I trust that he may be granted a khillut in cash and kind from time to time if the Lieutenant Governor may be pleased to order.

* Extract, paragraphs 39 to 41, of Mr. Forsyth's Memorandum, dated 23rd July 1866.

Extract, paragraphs 14 to 16, of his letter, No. 235, dated 14th September 1866.

Extract, paragraph 6, of Secretary to Financial Commissioner's letter, No. 456, dated 11th September 1866.

Extract of diary of Captain Smyly, Assistant Commissioner, Kulu, dated 16th August 1864.

EXTRACT, paragraphs 14, 15, and 16, of a LETTER from *T. D. Forsyth*, Esq., c. B., Commissioner and Superintendent, Jullundhur Division, to *T. H. Thornton*, Esq., Secretary to Government of the Punjab (No. 235); dated 14th September 1866.

14. THE last point which requires immediate attention is the question of allowances to the Negee of Lahoul.

15. In a former communication I remarked that I had reason to believe that Tara Chund had been offered certain pecuniary help from Cashmere, though I could not get at the truth of this.

16. Since then, and when the abolition of tribute was being agitated before the Viceroy, I found that Hurree Chund was suddenly rather lukewarm on the subject, and at last he told me that his father received in presents and perquisites about 250 rupees or 300 rupees per annum from Cashmere. I mentioned this to the Viceroy, who was pleased to remark that in any arrangements now made the Negee of Lahoul ought not to be a loser; and with this expression of His Excellency's opinion, I now would ask that some formal assurance may be given to Tara Chund, so as to remove all fears from his mind. I think that Tara Chund ought to have an increase of 400 rupees to his present allowance, so as to remove him from all temptation. For the Nono of Spiti I have proposed a grant of 300 rupees.

EXTRACT, paragraph 6, of a LETTER from *J. A. E. Miller*, Esq., Secretary to Financial Commissioner, Punjab, to *T. H. Thornton*, Esq., Secretary to Government of the Punjab (No. 456); dated 11th September 1866.

THE Financial Commissioner considers that it would be good policy to treat with liberality and consideration an influential man on our frontier like Tara Chund.

EXTRACT of DIARY of Captain *Smyly*, Assistant Commissioner, Kulu;
dated 16th August 1864.

I HAVE been pleased with what I have seen and heard of Tara Chund's conduct of affairs in Lahoul, and I believe him to be, as far as his light goes, a trustworthy person to exercise authority in such an isolated position, where so many opportunities for extortion and injustice offer. He has a kind and gentle disposition, and in all his dealings with the people there is a tendency to the *suaviter in modo* rather than towards the *fortiter in re*, which is a favourable trait, seeing that the Lahoules are generally so truthful, obedient, and honest. I have been informed by the Moravian Missionaries, who see a great deal of the country people and have frequent opportunities of conversing freely with them, that Tara Chund is above taking *douceurs*. There is no doubt about his popularity with the Lahoules, who invariably acquiesce to his dictum, which of itself is a healthy sign. As for Tara Chund's attention to the wants of European travellers, the testimonials he has earned, some of them most flattering and gratifying, prove that the trouble he has taken in this respect is fully appreciated. Like so many of those hill chiefs, Tara Chund has exceeded his income, and is indebted to Kulu Mahajuns, Wuzeer Gooshaon of Munde amongst the rest.

Might be granted
a khilut on such
a good report.
(signed)
A. Brandreth.

From *J. W. S. Wyllie*, Esq., Officiating Secretary to the Government of India, Foreign Department, to the Secretary to Government of the Punjab (No. 79); dated Fort William, 22nd January 1867.

I HAVE laid before the Governor General in Council your letter, No. 534-2514, dated 13th ultimo, with its enclosures.

2. The points requiring consideration are, first, the allowance to be given to the Negee of Lahoul; and secondly, the deputation of a European officer to Ladakh.

3. On the first point His Excellency in Council desires me to state that the proposals of the Lieutenant Governor, as detailed in the last paragraph of your letter under acknowledgement, are sanctioned; but it must be distinctly understood that these allowances are personal and in lieu of service, and therefore will not be heritable, unless the Government should, on Tara Chund's death, think proper again to entrust the charge of Lahoul to the male representative of his family.

4. On the second point I am to state that the Governor General in Council agrees to the deputation of an officer to Ladakh as an experimental measure for one season. At the close of the season sufficient data will have been obtained for considering whether the arrangement is to be further continued. Should it be made permanent, the cost, I am to

remark, will amount to the whole allowances of one officer, seeing that his place in the general administration must be filled up by a substitute.

5. It will be necessary to exercise great care in the selection of the officer now to be deputed, and he must, of course, be cautioned against any interference in the internal administration of the country. The primary object he will have to keep in view will be the maintenance of the tariff fixed by the Maharajah in 1864. Any infraction of this tariff, which his remonstrances on the spot may be unable to prevent, should be promptly reported to the Punjab Government. Another and very important branch of his duties will be to enquire closely into the nature and extent of the traffic, as it at present stands, between India and Central Asia, and to report the measures which he would recommend to secure a further development of this trade. Lastly, he will pick up and sift all the political information that may come in his way, especially as regards the progress of events in Chinese Toorkistan.

6. It is obvious that an officer possessed of sufficient intelligence and discretion for such a position cannot readily be found. The main qualification to be sought for will be aptitude for commercial and political inquiries. But if the Lieutenant Governor should know of any Medical Officer who may unite, with the capacity chiefly required a willingness to exercise his profession gratuitously among the people of Ladakh, the Governor General in Council thinks that a medical officer would, on the whole, be the happiest selection that could be made.

7. The deputation of an English officer to Ladakh will supersede the necessity for a native news-writer at that place. Any information which the news-writer of last season may have collected should now be submitted for the information of the Government of India.

From *T. H. Thornton*, Esq., Secretary to Government of the Punjab, to *J. W. S. Wyllie*, Esq., Officiating Secretary to the Government of India, Foreign Department, Fort William (No. 16-105); dated Lahore, 10th January 1867.

IN continuation of my No. 534, dated 13th December 1866, I am directed to forward a khureeta (with translation annexed) from the Maharajah of Jummoo, stating that he has remitted the tribute hitherto levied by his Highness from the people of Lâhoul.

TRANSLATION of a LETTER from the Maharajah of Jummoo, to his Excellency the Viceroy of India; dated 21st December 1866.

REPORTS that, in obedience to the orders of his Excellency, given to Dewan Nihal Chund, at Simla, the Maharajah has remitted the tribute in money and iron levied from the Zemindars of Lâhoul since the time of the former rajahs of that territory.

From *T. H. Thornton*, Esq., Secretary to Government of the Punjab, to *J. W. S. Wyllie*, Esq., Officiating Secretary to the Government of India, Foreign Department (No. 34-164); dated Lahore, 21st January 1867.

IN continuation of my letter, No. 534-2514, dated 13th December 1866, I am directed by the Honourable the Lieutenant Governor to transmit, for the information of the Right Honourable the Governor General, copies of a further communication from the Commissioner, Jullundhur Division, and its enclosure, No. 6, dated 5th instant, relative to the exactions by officials of the Cashmere State on British traders at Ladakh.

2. These papers appear to his Honor to afford additional grounds for the measure recommended of deputing an European officer to Ladakh during the ensuing season.

From *T. D. Forsyth*, Esq., C.B., Commissioner and Superintendent, Jullundhur Division, to *T. H. Thornton*, Esq., D.C.L., Secretary to Government, Punjab (No. 6); dated 5th January 1867.

WITH reference to your letter, No. 1912, dated 15th September 1866, forwarding translation of the letter from the Maharajah of Cashmere asking for information as to the particular exactions of which individual traders complain, I have obtained a reply from Tara Chund and Wuzer Goshon, which I now forward with a translation.

2. At the same time Tara Chund has forwarded me a copy of the new tariff printed and promulgated in 1864.

3. I have

3. I have now to remark—

1st. That the vernacular tariff does not agree with the English counterpart.

2nd. That the reductions announced in it have not been carried out.

3rd. That in addition to these duties, other heavy exactions are levied.

4th. That further inquiry leads me to think that Mr. Davies laboured under a misapprehension when he remarked, in the 10th paragraph of his letter, No. 223, dated 29th April 1864, to Supreme Government, that the rates on goods proceeding to Leh by the Kooloo route were always pretty reasonable, and are still generally below the revised rates.

4. In the English copy of Statement IIB., table of rates on goods passing from Ladakh to Kooloo and Rampoor, the column of present duty on goods exported to Kooloo is left blank, and so is that showing the difference.

Similarly, the columns showing former rates on goods by Rampoor and the difference are blank, thus leading to the conclusion that there has been no change in either case.

5. But in the Vernacular Statement there is some difference between the former and present rates as regards both routes; and, again, there is a reduction in some cases made in favour of Rampoor which is not accorded to Kooloo.

				<i>Rs. a. p.</i>	
For instance, Cherrus	-	-	-	1 - -	By Kooloo route. The same are charged only 10 annas by Rampoor route.
Silk	-	-	-	1 4 -	
Gillur Puttur	-	-	-	1 4 -	
Yamboo	-	-	-	-	Are charged double by Kooloo what is taken by Rampoor.
Silung	-	-	-	-	
Gooli darcheenee	-	-	-	-	

Tuwar is entered in the English Statement as paying nothing by Kooloo and 4 annas by Rampoor, but in the Vernacular Statement it is charged *Rs.* 1. 4. by Kooloo and 2 annas by Rampoor.

6. Again, in Statement IIA. there is a striking difference between the duties levied on Kooloo and the Rampoor route, opium, kiriana, otter skins, copper vessels being taxed only one-half by Rampoor, and English piecegoods are subjected to *Rs.* 2. 3. per maund by Kooloo, and only 10 annas 6 pie by Rampoor.

7. Tara Chund's Statement shows that the professed reductions are not attended to, and Hurree Chund gave in to the Viceroy, as I see is alluded to in Mr. Secretary's letter, a statement from which, for convenience sake, I give the subjoined extract.

Some of the most important articles are taxed as follows:—

OPIUM.

				<i>Rs. a. p.</i>	
Customs dues	-	-	-	2 8 -	per maund, kutchu.
Choongees, Leh	-	-	-	13 2 -	" "
Nuzzar Bhuttee taken by Thanadar at Leh	-	-	-	-	-
1½ annas per rupee, or about	-	-	-	12 7 6	" "
Brokerage, 2 per cent.	-	-	-	2 8 -	" "
TOTAL	-	-	-	<i>Rs.</i> 18 4 8	per maund, kutchu.

Average value of maund, *Rs.* 133 - -

SUGAR.

				<i>Rs. a. p.</i>	
Customs dues	-	-	-	1 4 -	per maund.
Choongee	-	-	-	1 7 -	"
Nuzzar Bhuttee	-	-	-	1 8 -	"
Brokerage	-	-	-	5 2 -	"
TOTAL	-	-	-	<i>Rs.</i> 3 2 9	

SPICES.

The Same.

BROADCLOTH.

The same.

IRON.

Customs duty, 2 rupees. Choongee, &c., as above.

8. In addition to all these rates, there is the export tax as enumerated in the penultimate column of Statement IIA.

9. All these exactions were probably not made known to Mr. Davies when he made his report, but I wish to point them out, for they will remove the impression which a perusal of that report gives, that the Kooloo route was the most favoured, whereas, in reality, it is the least so of all the lines.

10. But leaving the past, my object is to secure a proper reduction of rates for the future.

11. According to paragraph 13 of Mr. Davies's letter, No. 223, dated 29th April 1864, a uniform transit duty of 5 per cent. has now been fixed for goods going to Leh, and it is added that thus the trader to Yarkand by Srinuggur is placed in a position, fiscally, not less advantageous than that of one trading with Bokhara by Peshawur.

12. We have here, then, a clearly-enunciated standard to work by, and during the approaching season I should wish to see this carried out under the supervision of the English officer who may be sent to Leh. All goods, of whatever kind, which do not break bulk in the Ladakh territories, but which pass through the town of Leh, ought not to pay to the Government or any official one fraction more than 5 per cent. If opened in Leh, and any portion is sold there, then the higher rate of 8 per cent. on piece-goods and $12\frac{1}{2}$ per cent. on other articles would be levied.

13. I consider this rate much higher than ought to be levied, but we must work by degrees. Elsewhere transit duties are either abolished or reduced to 1 per cent., and if the Maharajah takes 5 per cent., he ought to repair the road for his merchant travellers.

14. I have hitherto written regarding goods passing through Leh. But you are aware that it is my desire to send traders and merchandise to Khotan and Yarkand by the Chang Chemoo route, as thus by far the easiest passage over the Karakorum range can be effected, and by this route I hope the Maharajah may be induced to allow goods to pass free.

15. I sincerely trust an European official may be sent to Ladakh. It is quite hopeless otherwise attempting to free our trade, for, however much the Maharajah may desire to help us, experience teaches us that native underlings placed at so great a distance from control cannot resist the temptation to commit petty oppression. An European traveller, who was at Leh for some time last year, told me a day or two ago that some Guddees from Kangra came to him to intercede with the thannadar to allow them to buy food, which had been forbidden unless they presented a nuzzur of several rupees; and in a hundred ways our traders can be, and are, subjected to annoyances and exactions.

16. And from what Tara Chund, writing from Lahoul, and my European informant tells me, I doubt whether any reliance can be placed on the information supplied by the news-writer stationed at Leh by the orders of Government.

TRANSLATION OF PETITION.

In accordance with your orders I enquired from the traders of Ladakh regarding duty, and find that the list of duty which my son, Hurree Chund, at Simla, submitted before yourself is the one according to which duty is realised in the Ladakh territory, and that the tariff of customs duty prescribed by Government for the Jummoo territory is not in force there.

On inquiry I have also learnt from Noora and other traders that the "Ladakhwallas" have increased the duty on some articles, on that entered in the tariff of customs duty. For instance—

First.—Formerly *Rs.* 1. 4. was realised as duty on a maund of "Shukkur," or "Goor," but by the tariff of customs duty it was reduced to 2 annas and 3 pie, and the Ladakhwallas, contrary to the tariff of customs duty, realised, as formerly, *Rs.* 1. 4.

Second.—*Rs.* 1. 4. was the duty on a maund of Misree, reduced by the tariff of customs duty to 9 annas 6 pie, realized by the Ladakhwallas, as formerly, *Rs.* 1. 4.

*Per pony load.

Thirdly.—When a bale of churru is imported from Yarkand to Ladakh, *Rs.* 18. 6.* are realised, and when exported from Ladakh to Kooloo seven rupees more are realised from the traders, although no mention of the realisation of any duty on goods exported from Ladakh to Kooloo is made in the tariff of customs duty, except a duty of one rupee per load.

All the traders now pray that Government may fix duty on our goods at the rates fixed for the routes by Rampoor and Cashmere, for it is a wrong custom to take double rates from the subjects of the Government, and only single rates from those travelling by Cashmere and Rampoor. We therefore beg that Government may make some permanent arrangement for taking the single rates, or somewhat less.

Herewith is submitted, separately, a list of exactions levied during the present year. A copy of the tariff fixed for the levy of customs duties accompanies this petition.

(signed) *Tara Chund.*

STATEMENT showing the Name of MERCHANDISE Imported to and Exported from *Ladakh* by *Kooloo*, and the Amount of Duty realised in Excess of that noted in the Tariff of Customs Duty.

Name of Trader.	Name of Merchandise.	Duty realised formerly.	Duty to be realised at present according to Tariff.	Reduction made by Government.	Duty now realised as formerly.	REMARKS.
		<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	<i>Rs. a. p.</i>	
Noora - -	Goor and shukkur, per maund.	1 4 -	- 2 3	1 1 9	1 4 -	The duty on misree, goor, shukkur, and sugar has been realised according to the former usage.
--	Sugar, ditto - -	1 4 -	- 9 6	- 10 6	1 4 -	
--	Bhung, per bale - -	- - -	- - -	- - -	- - -	When a bale of bhung is imported from Yarkand to Ladakh, <i>Rs.</i> 18. 6. on account of duty are levied on each pony load, and when it is exported from Ladakh by way of Kooloo, seven rupees per load are again realised. But no mention of the export duty is made in the tariff of customs duty sanctioned by Govern- ment.
Nicka - -	Goor, per maund - -	1 4 -	- 2 3	1 1 9	1 4 -	Ditto - - - ditto.
--	Misree - ditto - -	1 4 -	- 9 6	- 10 6	1 4 -	Ditto - - - ditto.
Goonga - -	Goor - ditto - -	1 4 -	- 2 3	1 1 9	1 4 -	Ditto - - - ditto.
--	Misree - ditto - -	1 4 -	- 9 6	- 10 6	1 4 -	Ditto - - - ditto.
Husu - -	Ditto - ditto - -	1 4 -	- 9 6	- 10 6	1 4 -	Ditto - - - ditto.
Deen Mahomed -	Ditto - ditto - -	1 4 -	- 9 6	- 10 6	1 4 -	Ditto - - - ditto.

STATEMENT of Increase and Decrease of DUTY levied on GOODS at *Ladakh*, submitted by *Wuzeer Goshoon*.

No.	Name of Articles.	Duty on Goods Exported from Yarkund to Ladakh and Imported from thence.				Duty on Goods Exported from Kooloo to Ladakh and Imported from thence.				Duty on Goods Exported from Yarkund to Ladakh and Imported from thence to Rampoor and Bussahir.				STATEMENT MADE BY THE TRADERS.		
		Number or Quantity.	Former Duty.	Present Duty.	Difference.		Former Duty.	Present Duty.	Decrease.	Increase.	Former Duty.	Present Duty.	Decrease.		Increase.	
					Decrease.	Increase.										
1	Opium	-	-	-	-	-	-	-	-	-	-	-	-	Duty is levied according to the fixed rates.		
2	Misree	-	-	-	-	-	-	-	-	-	-	-	-	Noor Bux.—The reduction of 10 annas 6 pie made is not allowed.		
3	Lakhee	-	-	-	-	-	-	-	-	-	-	-	-	Buldeo.—Six pies are levied in excess.		
4	Copper	-	-	-	-	-	-	-	-	-	-	-	-	No decrease or increase.		
5	Oter skins	-	-	-	-	-	-	-	-	-	-	-	-	Ditto - - ditto.		
6	Indigo	-	-	-	-	-	-	-	-	-	-	-	-	Noor Bux.—There is an increase of one rupee in this.		
7	Tamarind	-	-	-	-	-	-	-	-	-	-	-	-	No decrease or increase.		
8	Copper utensils	-	-	-	-	-	-	-	-	-	-	-	-	Ditto - - ditto.		
9	Iron	-	-	-	-	-	-	-	-	-	-	-	-	Ditto - - ditto.		
10	Goor and shinkkur	-	-	-	-	-	-	-	-	-	-	-	-	Noor Bux.—The former duty of Rs. 1. 4 is still levied, and the excess, Rs. 1. 1. 9, has not been refunded.		
11	Sugar	-	-	-	-	-	-	-	-	-	-	-	-	Ditto - - - ditto.		
12	Buzazee piece goods, cotton, silk, woollen.	-	-	-	-	-	-	-	-	-	-	-	-	Buldeo and others.—Five annas are levied in excess.		
13	Turneric and dry ginger, &c.	-	-	-	-	-	-	-	-	-	-	-	-	Noor Bux.—One anna six pie are levied in excess.		
14	Khinkhab, per large piece.	-	-	-	-	-	-	-	-	-	-	-	-	Buldeo.—There is a decrease of 8 annas in this.		
15	Ditto - - small -	-	-	-	-	-	-	-	-	-	-	-	-	Ditto - - - - - 4 annas.		
16	Broadcloth	-	-	-	-	-	-	-	-	-	-	-	-	Buldeo.—Eight annas are levied in excess.		
17	Soap	-	-	-	-	-	-	-	-	-	-	-	-	Ditto - - - ditto.		
18	Kulgee Moodyzeeren	-	-	-	-	-	-	-	-	-	-	-	-	Buldeo.—Formerly one kulgee was taken as duty for 100 kulgees, and now 10; 9 are in excess.		
19	Gurda Bhung, i. e., Churru.	-	-	-	-	-	-	-	-	-	-	-	-	Noor Bux.—Formerly the duty was 1 rupee per pony load, and now 1 rupee per maund; 6 rupees are levied in excess.		
														(signed)	Buldeo. Noor Bux. Jhurrung, Mahomed Ally, Hussun, Sabrung, Rahem Sheikh.	Abdoolla. Bhoomkull. Abdool Raheem, Gholam, Hussun Multik, Deen Mahomed, All Traders.
														(signed)	Witnesses, Gumesh, of Kooloo. Dulla, Rampoor, ditto.	

(signed)

Buldeo.

Noor Bux.

Jhurrung.

Mohomed Ally,

Hussun,

Subrung,

Rehem Shaik.

Abdoolla.

Bhoomkull.

Abdool Rehman,

Gholam, Mullik,

Deen Mahomed,

Witnesses,

Gunes, of Kooloo.

Buldeo.

Buldeo.

Buldeo.

Buldeo.

Buldeo.

Buldeo.

Buldeo.

Buldeo.

Buldeo.

Buldeo.

Buldeo.

Buldeo.

Buldeo.

(No. 113.—Foreign Department.—Political.)

The Governor General of India in Council to Sir *Stafford Northcote*, Bart.,
Secretary of State for India, dated Simla, 22nd June 1867.

IN continuation of our Despatch No. 40, dated the 23rd February last, reporting the experimental deputation of an officer to Ladakh, we have the honour to forward the accompanying copy of papers showing that, subject to the approval of Her Majesty's Government, we have fixed 1,000 rupees as the remuneration to the officer in question.

From *T. H. Thornton*, Esq., Secretary to Government of the Punjab and its Dependencies, to *J. W. S. Wyllie*, Esq., Officiating Secretary to the Government of India, Foreign Department (No. 81-451); dated Lahore, 21st February 1867.

I AM directed to acknowledge the receipt of your letter, No. 79, dated 22nd ultimo. With reference to your sixth paragraph, I am directed to state that the Lieutenant-Governor fully concurs in regarding the deputation of a Medical Officer to Ladakh as highly desirable, if a suitable one can be procured. But as in this case his substantive duties will have to be performed by another medical officer on full allowances, it is presumed that the Supreme Government is prepared to regard as a special extra outlay the full pay and allowances drawn by the officer who may be deputed for the six months to which his deputation to Ladakh must probably be limited. And before endeavouring to select an officer for the post, it is necessary that his honour be informed what deputation allowance will be granted to such officer. Medical officers attached to a native regiment and performing the civil duties ordinarily receive at present in this province 780 rupees per mensem; and it appears to the Lieutenant Governor that the consolidated allowance to be granted to the officer deputed to Ladakh should be somewhat in excess of this, to cover the extra expenses which he must necessarily incur, and to enable his Honor to secure the services of the best officer available.

LADAKH REPORT for 1866.

EXTRACT from the PROCEEDINGS of the Government of India, in the Foreign Department (No. 282); under date Fort William, 25th March 1867.

READ a letter from the Secretary to the Government of the Punjab, No. 81-451, dated 21st February last, submitting an abstract of the Ladakh news-writer's report during the last season, and requesting the decision of the Government of India as to the pay to be allowed to the medical officer who is to be deputed to Ladakh in the coming season.

OBSERVATIONS.

As regards the pay of the medical officer whom it has been determined to depute to Ladakh, the Governor General in Council is of opinion that 1,000 rupees per mensem, to include travelling allowance, might be given for one season to cover all expenses.

(No. 283.)

ORDERED, that in continuation of No. 80, dated 22nd January last, a copy of the foregoing observations be sent to the Financial Department for early consideration regarding the pay of the medical officer.

EXTRACT from the PROCEEDINGS of the Government of India, in the Financial Department—(No. 1771); under date Fort William, 30th March 1867.

READ order of the Foreign Department, No. 283, dated 25th instant, forwarding, in continuation of No. 80, dated 22nd January last, observations relative to the pay of the medical officer to be deputed to Ladakh during the ensuing season.

RESOLUTION.

The Governor General in Council is pleased to sanction a monthly salary of 1,000 rupees, to include travelling expenses to the medical officer who may be deputed to Ladakh during the ensuing season.

Ordered, that the foregoing resolution be communicated to the Foreign Department and to the Accountant General, Punjab.

(No. 182.—Political.)

EXTRACT of LETTER from Sir *Stafford Northcote*, Bart., to the Governor General of India in Council, dated India Office, 15th November 1867.

I have received and considered in Council your Excellency's letters, Nos. 40, 113, and 114, in the Foreign Department, of the 23rd February and 22nd June last, the two former reporting the appointment of a British Commercial Agent, in the person of Dr. Cayley, at Ladakh, to observe the operation of the Cashmere Customs Tariff of 1864, and the fixing of his salary at 1,000 rupees per mensem.

I approve your having fixed Dr. Cayley's monthly salary at 1,000 rupees, and observe that he is to be stationed at Ladakh for six months in the year, and in the first instance, experimentally, for one season only.

I approve the small increase to the allowances of the Negee of Lahoul.

(No. 176.—Foreign Department.—Political.)

The Governor General of India in Council to Sir *Stafford Northcote*, Bart., Secretary of State for India; dated Fort William, 7th December 1867.

IN continuation of our Despatch, No. 113, dated the 22nd June last, we have the honour to transmit, for the information of her Majesty's Government, the accompanying copy of a correspondence with the Punjab Government regarding the deputation of an officer annually to Ladakh.

From *T. H. Thornton*, Esq., Secretary to Government of the Punjab, to the Secretary to the Government of India, Foreign Department, with the Governor General, Simla, Confidential (No. 352-755); dated Murree, 26th September 1867.

I AM desired to submit an extract from a demi-official letter from Dr. Cayley, on special duty at Ladakh, and to solicit an expression of the wishes of the Government as to that officer's future proceedings.

2. The Lieutenant Governor is of opinion that Dr. Cayley should certainly stay until the arrival of the last kafilā from Yarkand in November; but he thinks it unadvisable that an English officer should remain alone at Ladakh during the winter.

3. But with reference to Dr. Cayley's remark that, "unless it is known that the appointment will be continued or renewed, little or no permanent good will result," his Honor would suggest that, in the event of the Supreme Government being willing that the deputation of an agent to Ladakh should be repeated each season during the pleasure of Government, he be authorised to intimate accordingly to his Highness the Maharajah.

4. The presence of Dr. Cayley at Ladakh has already led to a reduction of duty on goods imported *viâ* Kulu, and his Honor hears from the Commissioner of Jullundhur that it has greatly increased the confidence of the traders of Lahoul.

EXTRACT from a demi-official LETTER from Dr. *Cayley*, on special duty at Ladakh, to *T. H. Thornton*, Esq., Secretary to Government of the Punjab; dated 15th July 1867.

WITH regard to the effect of my residence here, I think, from what I hear, that the Rajah wishes to act justly both to the traders and people of the country; but I am quite sure that, as regards the officials here, directly my back is turned the corruptions of previous years will be resumed; and unless it is known that the appointment is to be continued or renewed, little or no permanent good will result. Under these circumstances, should it be the wish of Government, I am quite ready to remain up the winter, although it would involve no small personal discomfort, and, I may say, hardship; but as all communication would then for some months be quite cut off, it would, I think, be equally advantageous for me to remain here as late as possible, and return as soon as the road is open next year, if it is intended to renew the appointment. I am not asking this on personal grounds, but in the interests of my work, and of the traders and people of the country (for though with the latter I have nothing to do officially, I cannot shut my eyes to the system

of oppression by which they are ground down to the dust), who, unless they are assured of protection next year, will never venture to open their lips as to any wrong they may suffer; such is their terror of the local officials. I cannot directly make use of any information I pick up, lest I subject the informer to future cruelty, and even the servants I have engaged here, not supplied by the Thannadar, are in terror, lest, on my leaving, they should suffer ill-treatment on my account.

(True extract.)

(signed) *W. Kirke*,
Assistant Secretary to Government, Punjab.

From *J. W. S. Wyllie*, Esq., Under Secretary to the Government of India, Foreign Department, with the Governor General, to the Secretary to Government of the Punjab (No. 1034); dated Simla, 14th October 1867.

IN reply to your letter, No. 352-755, dated 26th ultimo, I am directed to state that the communication which the Lieutenant Governor proposes to make to the Maharajah of Cashmere, announcing the present intention of the British Government to depute an agent every season to Ladakh, is approved by the Governor General in Council.

(No. 22.—Political).

Sir *Stafford Northcote*, Bart., to the Governor General of India in Council.

India Office, 15 February 1868.

1. I GATHER from the letter of your Excellency's Government, in the Foreign Department, No. 176, of the 7th of December 1867, that you have sanctioned the deputation of a British Officer every season to Ladakh, for the purposes brought to my notice in your letter, No. 113, of the 22nd of June, the arrangement having been originally proposed to and acquiesced in by me, as an experimental measure for one season only.

2. The extension of this policy, as now suggested, is sanctioned by Her Majesty's Government with the full understanding that Dr. Cayley, as commercial agent in Ladakh, is ever to bear in mind that he is in foreign territory, and, whilst exerting his influence for objects which you may consider it to be expedient and just to secure by friendly representation and advice, to abstain from any peremptory acts and dictatorial language calculated to give offence to the rulers of these countries.

(No. 177.—Foreign Department.—Political).

The Governor General of India in Council, to Sir *Stafford Northcote*, Bart., Secretary of State for India; dated Fort William, 7th December 1867.

IN continuation of our Despatch, No. 153, dated 9th October last, we have the honour to forward, for the information of Her Majesty's Government, the accompanying copy of a letter from the Secretary to the Government of the Punjab, and of its enclosures, regarding the restrictions imposed by the Cashmere authorities at Ladakh upon the trade between Eastern Toorkistan and British India.

2. From further papers herewith submitted, it will be seen that his Highness the Maharajah has, at the instance of the Punjab Government, applied the rate of 5 per cent. to all imports from Central Asia.

From *T. H. Thornton, Esq.*, Secretary to Government of the Punjab, to the Secretary to the Government of India, Foreign Department, with the Governor General, Simla (No. 371-786); dated Murree, 9th October 1867.

I AM desired to transmit, for the information of his Excellency the Right Honourable the Governor General in Council, copies of the papers marginally noted on the subject of the interference exercised at

Extract, paragraphs 1 and 2, from the diary of Dr. Cayley, on special duty at Leh, dated 27 September 1867.

Reply, No. 787, of this date.

Translations of khureetas addressed to the Maharajah.

Ladakh with trade from Yarkand and Turkistan with British India, which trade promises considerably to increase if the duties levied are not exorbitant, and the merchants fairly treated.

2. In the letters addressed by this Government to his Highness the Maharajah, it has been assumed that the acts of which Dr. Cayley complains are the acts of the Ladakh officials only, but there is reason to believe that they are really done with the cognizance and approval of the Cashmere authorities; indeed, as regards the importation of wool, my predecessor, in his Despatch, No. 343, dated 29th April 1864, remarked that "it seems that the Maharajah is quite determined that none of the fine turfani wool shall go out of his territory, as the rates on this article are nowhere detailed."

3. It is not improbable, therefore, that his Highness the Maharajah will object to comply with one or both of the requests of this Government contained in the above letters.

4. Should such be the case, I am desired to inquire what action in the matter his Excellency the Viceroy in Council would wish to be taken by this Government.

EXTRACT, paragraphs 1 and 2, from the Diary of Dr. Cayley, on Special Duty at Leh; dated 27th September 1867.

IN continuation of my last report, I have to bring to your notice a few points connected with the trade through Ladakh, and which, owing to the arrival of the Yarkand kafilas, are of the greatest importance, and I request the favour of your furnishing me with instructions on the subject as soon as possible. In the "tariff of transit duties," 1867, page 59, para. 4, it is laid down (when referring to the transit duties in Ladakh on goods coming from Lahoul) that the transit duty on goods intended for Turkistan, Yarkand, &c., should be limited to 5 per cent. *ad valorem* (this has not, however, yet been really carried into effect), but nothing is anywhere mentioned that I can discover, in any letter or in any tariff, of the amount of transit duty to be levied on goods passing unopened through Ladakh and coming from Yarkand, &c. It appears that in former years few or no merchants ever passed through, but always bartered their goods in, Leh, the through trade being almost confined to the trading agents of the Cashmere officials; but this year independent merchants are flocking in from Yarkand, and many wish to carry their goods through unopened to Palimpar and the Punjab. These men had heard from a party of return pilgrims from Mecca (who left Leh soon after my arrival, and who had all been under my medical treatment for severe illness, the result of cold and exposure on the Zooji La pass, where two of their number were frozen to death), that there was a British officer at Leh to protect the traders, and that the duties were much reduced; and, in consequence, nearly all the Yarkand merchants who formerly went to Badakshan, or travelled by Chatial and Swat to the Punjab, are now coming this route, which is so much safer and easier. Those who open or sell their goods in Ladakh must of course pay the duties laid down in the tariff, amounting, import and export, to about 25 per cent., or more than 100 per cent. on the cost price; and the officials here want to charge the same duties on goods passing through unopened; but as there is no authority for this, and nothing laid down in the tariff, I have insisted that, until instructions are received from Government, only a 5 per cent. *ad valorem* duty should be charged, corresponding to the transit duty sanctioned for goods passing the other way. The Dewan will not consent to this, but is willing to take a receipt from each merchant of the amount and value of his goods, and not to levy the duty until he has received the Maharajah's orders; the merchants, however, are not to be detained, as they would in that case suffer great loss. This is a matter of very great and immediate importance; in fact, the future extension of trade with Turkistan greatly depends on the decision now given. Nearly all the merchants now arrived, and those on their way have never come this route before, and are now come in the full belief that the duties are reduced, and that they will meet with fair treatment. There is no doubt that the trade from all the chief cities of Turkistan will flow this way another year. If, however, a transit duty of 100 per cent. (on the cost price) is imposed, it will prove simply prohibitive, and will at once kill the trade, which has been languishing for years, but seems now ready to spring up into vigour if fairly treated. As the point has now for the first time to be settled, I cannot too strongly represent how injurious it will prove if the Cashmere Government is allowed to impose a transit duty of anything like the amount above mentioned; a transit duty of 5 per cent. for passing through a few miles of Ladakh territory should be the limit.

2. I have another point to urge; the authorities here have never allowed the shawl-wool (pushm), which comes from Yarkand, to pass by any other route than into Cashmere; in fact,

fact, a few years ago they forcibly seized and confiscated a large amount that was being taken by British traders into Lahoul. As, however, there is no mention of such a restriction in any of the tables of duties, I cannot discern that any such right has ever been demanded by Cashmere, or admitted and sanctioned by the Punjab Government. I have insisted that merchants are to be allowed to carry "pushm" or any other article they wish into British territory on paying the recognised duties, and that no such restrictions are admissible. This has met with the strongest opposition on the part of the Ladakh officials, but I feel sure that I am only acting in accordance with the spirit of my instructions in enforcing this point, which is one of the great subjects of complaint on the part of the traders, and has hitherto thrown most serious obstacles in the way of trade.

From T. H. Thornton, Esq., Secretary to Government of the Punjab, to H. Cayley, Esq., on Special Duty, Ladakh (No. 787); dated 9th October 1867.

I HAVE the honour to acknowledge the receipt of your diary on the 27th September, bringing to notice that the officials at Ladakh were desirous of charging on goods in transit from Yarkand to British territory the import and export duties prescribed for goods intended for sale or consumption in Cashmere, instead of a 5 per cent. *ad valorem* duty charged for goods in transit from the Punjab to Yarkand; and that you had objected to their demand.

2. In reply, I am desired to intimate to you that his Honor approves of the action you have taken in this matter, and I beg to annex for your information translation of a letter this day addressed to the Maharajah on the subject.

3. His Honor further approves the course you have taken in regard to the shawl-wool merchants, whose case has been made the subject of a separate communication to his Highness, copy of which is annexed.

TRANSLATION of a KHUREETA to His Highness the Maharajah of Cashmere.

I REGRET to have to bring to your Highness's notice another instance of the obstruction caused by your officials at Ladakh to the development of trade with British India.

It appears that traders bringing shawl-wool from Yarkand are not permitted to carry their wool into British territory like other merchants, but are compelled to proceed with their goods to Cashmere.

As there is nothing in the prescribed tariff to justify this arbitrary conduct on the part of your Highness's officials, Dr. Cayley has insisted upon the shawl-wool merchants being permitted to proceed by whatever route they please, like any other merchants, on payment of the recognised duties.

The Lieutenant Governor approves of Dr. Cayley's conduct in this matter, and he trusts that your Highness will at once issue the necessary orders to prevent further interference on the part of the Ladakh officials.

A copy of this communication will be sent to Dr. Cayley for his information and guidance.

TRANSLATION of a KHUREETA to his Highness the Maharajah of Cashmere.

In the note appended to Statement I. A. of the revised tariff of duties chargeable on goods entering Cashmere territory, it is stated that goods from the Punjab passing through Leh *en route* for Yarkand and Turkistan, without being opened or sold, should be liable to a five per cent. *ad valorem* duty only, but no express allusion is made to the case of goods passing under similar circumstances from Yarkand and Turkistan through Leh to the Punjab.

Your Highness's officials, taking advantage of this omission, desire to charge on such goods the exorbitant export and import duties prescribed for goods brought into Cashmere for sale or consumption in Cashmere, and thus greatly to interfere with the trade between Turkistan, and Tibet, and British India.

To this proceeding on the part of your Abilkars, Dr. Cayley, the officer on special duty at Ladakh, has objected, and his Honor the Lieutenant Governor considers he is quite justified in so doing, for though the note I have above quoted only provides for the case of goods passing through Leh from the Punjab, and makes no special mention of the case of goods passing through Leh from Yarkand, &c., yet the same principle is applicable to both cases, and any other interpretation would be opposed to the spirit of the rules.

The charge of a transit duty at all on goods passing through an angle of your Highness's territory unopened is, as I have remarked in a previous communication, greatly to be regretted, as it is a practice which has been abandoned by the more civilized States of India and elsewhere; but to charge on such goods the high export and import duties levied on goods intended for your Highness's dominions would be calculated to act most injuriously on the trade with British India, and can never have been contemplated by any enlightened ruler.

Accordingly, I am desired to request that your Highness will, without delay, issue orders to your officials at Leh to apply the tariff prescribed for goods passing from the Punjab to Yarkand, &c., to goods passing from Yarkand, &c., to the Punjab; and to inform his Honor of your having done so.

A copy of this communication will be sent to Dr. Cayley for his information.

From the Foreign Secretary to the Government of India to the Secretary to Government of the Punjab (No. 1083); dated Simla, 22nd October 1867.

I HAVE laid before the Governor General in Council your letter, No. 371, dated 9th instant, with its enclosures, regarding the restrictions imposed by the Cashmere authorities at Ladakh upon the trade from Eastern Turkistan with British India.

2. In reply, I am directed to state that his Excellency in Council approves of the communications which the Lieutenant Governor has addressed to the Maharajah of Cashmere on the subject, and authorises his Honor to press the demands made in those communications on the Maharajah's attention with equal courtesy and firmness.

From *T. H. Thornton*, Esq., Secretary to Government of the Punjab, to Foreign Secretary to Government of India, with the Governor General, Simla, Confidential (No. 381-807); dated Muree, 17th October 1867.

I AM directed to forward, for the information of his Excellency the Viceroy in Council, extracts, paragraphs 6 and 7, from Dr. Cayley's Diary, dated 1st instant, regarding emissaries of the Cashmere Government in Central Asia, and obstacles thrown by that Government in the way of Dr. Cayley to prevent traders freely communicating with him.

EXTRACT, paragraphs 6 and 7, from Dr. *Cayley's* Diary, dated 1st October 1867.

Para. 6. The Cashmere Government has agents and news-writers in Yarkand and Khotan and other cities of Turkistan, and there is no doubt that this year it has sent an envoy by Gilgit, and probably Badakshan, either to the Russians, at Khojend, or else to Kokan. It is kept a close secret, but all the traders, &c., know of one having gone.

7. Obstacles are still secretly thrown in my way to prevent the traders freely communicating with me. The Yarkand merchants are on their arrival privately told that they had better not give information or make any complaints to me, as their doing so will be displeasing to the Wazir and to the Maharajah; but that the Maharajah is going to reduce the duties and show them favour in every way. All this is done by some of the trading agents of the Wazir's, and under the directions of the Dewan here, and of course causes shyness and reserve on the part of the merchants, who are not sure whether they may not offend the Maharajah, and so injure their own interests in future years. This is a return to the obstructive system that I before brought to your notice.

(True Extract.)

(signed) *T. H. Thornton*,
Secretary to Government, Punjab.

From *T. H. Thornton*, Esq., Secretary to Government of the Punjab, to the Secretary to the Government of India, Foreign Department, with the Governor General (No. 836-394); dated Muree, 24th October 1867.

IN continuation of my letter, No. 371-786, dated 9th instant, and its enclosure, regarding levy of duty on through-trade from Yarkand to British territory, I am directed to forward, for the information of his Excellency in Council, translation of a letter from the Maharajah of Cashmere, and of my reply of this date thereto.

TRANSLATION of a LETTER from the Maharajah of Cashmere to *T. H. Thornton*, Esq., Secretary to Government of the Punjab; dated 17th October 1867.

REPLY to letter of Punjab Government regarding an *ad valorem* duty at the rate of 5 per cent. being levied on unopened merchandise imported from Yarkand, as in the case of similar goods exported from the Punjab.

References have been received from you repeatedly desiring that the tariff of 1864 should be acted upon. In the letter dated 13th April 1867, intimating the appointment of Dr. Cayley, it is expressly stated that the appointment has been made merely with the object of making inquiries regarding the rates of duties laid down in the tariff of 1864.

In

In Schedule 2 B. of that tariff the rate of duty to be levied on goods imported from Yarkand into Ladakh is laid down as follows:—

	<i>Rs.</i>	<i>a.</i>	<i>p.</i>
Garda Bhung and Shawl-wool - - - - -	13	6	-
Ditto - - ditto - imported from Rampore Bussaher - - -	10	-	-
Ditto - - ditto - - ditto - Kulu - - -	1	-	-

But as my kingdom thrives by the kindness of the British Government, I have made various reductions in the rates of duty.

In the letter of Sir R. Montgomery, dated 14th January 1863 (a copy of which is annexed hereto), the rate of duty on grocery is entered at 15 rupees per cent.; the same rate of duty, viz., 15 rupees per cent., is laid down therein as leviable on all merchandise imported into my dominions, whether intended for Jummoo or Cashmere, or for exportation to Turkistan, and without reference to its being opened or otherwise. But with the view of promoting commerce and pleasing the British Government, notwithstanding that the fulfilment of the conditions mentioned in the above roobacari was deferred by the British Government, I reduced the rate of duty on goods arriving in the Jummoo territory by more than one-half, and on goods arriving at Ladakh or Srinuggur to 12-8 rupees: the rate on unopened goods I fixed altogether at 5 rupees on the prices entered in the invoice, which, considering the price fetched for the goods at Ladakh, will not amount to more than 2 per cent. In the beginning of the present year, four months before the arrival of Dr. Cayley, I made further large reductions in the rates of duty on goods coming from Kulu, and entirely remitted the brokerage duty.

Now, if Dr. Cayley had considered that further revision of the duties was desirable, it was proper that he should have referred the matter to your office, and consulted me, but he took action on his own authority.

I have (before and since the receipt of your letter) written to my officials to carry out Dr. Cayley's orders, pending orders which the Government may issue hereafter.

My agent, whom I intend to depute to wait on his Honor the Lieutenant Governor at Lahore, will make proper representations in this matter.

I seek your satisfaction, and surely you will do nothing to subject me to loss.

Translation of a Letter from *T. H. Thornton*, Esq., Secretary to Government of the Punjab, to the Maharajah of Cashmere; dated Murree, 23rd October 1867.

I AM desired to acknowledge the receipt of your communication dated 17th instant, and to express his Honor's regret that your Highness has failed to give a direct reply to the request conveyed in my khureeta of the _____ to the effect that orders should be at once issued that goods arriving from Yarkand and the other countries beyond Cashmere in transit to British territory without being opened should not be charged with a duty of more than 5 per cent. *ad valorem*, the same as that leviable on goods passing from British territory unopened to Yarkand.

But your Highness, instead of giving a direct reply, or promptly complying with the request of his Honor the Lieutenant Governor, proposes to send a confidential agent to Lahore, and thus to waste another year in useless representation.

But his Honour, I am desired to state, can admit of no further delay; the matter is urgent, and it is most important that the merchants now assembled at Ladakh be at once informed that the exorbitant export and import duties shall no longer be charged on the through-trade from Turkistan to British India, or they will return disappointed to their homes,—a circumstance which cannot fail seriously to retard the progress of British commerce.

I am, therefore, again to request that your Highness will at once issue the requisite orders; and further, to warn you of the responsibility you incur by further delay.

I am to add that Dr. Cayley will be instructed to remain at Ladakh until the orders are duly promulgated.

From *T. H. Thornton*, Esq., Secretary to Government of the Punjab, to the Secretary to the Government of India, Foreign Department, with the Governor General—(No. 407-848); dated Murree, 28th October 1867.

I AM directed to forward, for the information of his Excellency the Viceroy in Council, extracts, paragraphs 1 to 3, from Dr. Cayley's diary, dated the 15th instant.

EXTRACT, paragraphs 1 to 3, from Dr. *H. Cayley's* Diary, dated 15th October 1867.

Paragraph 1.—A MAN named Shere Sing, an agent of the Maharajah, arrived here two nights ago from Yarkand, and went on the next morning to Jummoo. This man was formerly Kotwal of Srinuggur, and in the guise of a Mussulman was sent two years ago *viâ* Cabul and Badakshan to Bokhara, and then on to Samarkand and Khojend, as agent

of the Maharajah, and returned by Kokan and Yarkand. His arrival here was kept a close secret; he came in the night and went off the next morning. There is little doubt that he went as envoy from Cashmere to the Russian governor at Khojend. I hear that two men, named Ahmad Khan and Mahomed Khan, were brought to you from Jummo in February and March last by Dewan Jowala Sahai to give you such information as they picked up on a visit to Bokhara, from whence they had returned two months before. I am told by men coming from Yarkand that these two men were sent as agents of the Maharajah to Khojend, and had a friendly interview with the Russian governor there. Two agents of the Maharajah have returned this year, one from Khotan and one from Yarkand, and there are now two agents and news-writers in Yarkand who are constantly trying to get the traders from Hindoostan into trouble by representing them as spies, and one or two have been imprisoned in consequence. These two men seem to be even spreading ill reports about the intentions of the British Government with regard to Eastern Toorkistan.

2. The latest accounts of the Russians say that they have not taken, or advanced on, Samarkand, but after defeating the Bokhara army at Yangkurgan, 12 koss in front of Samarkand, they have not made any further advance, but that the people of Sheri Sebz (to the south of Samarkand) have submitted to Russia, and are prepared to join against Bokhara. The Khan of Kokan, too, has come to an understanding with Russia that, if Bokhara is taken, they will submit without resistance, but till then they are to be left alone.

3. Yarkandi traders are still arriving, and many have gone on *vid* Lahoul to the Punjab.

From the Foreign Secretary, with the Governor General, to the Secretary to Government of the Punjab (No. 1128); dated Camp Lucknow, 16th November 1867.

I HAVE laid before the Governor General in Council the extract from Dr. Cayley's diary

"There are now two agents and news-writers in Yarkand, who are constantly trying to get the traders from Hindoostan into trouble by representing them as spies." * * * * *

"These two men seem to be ever spreading ill reports about the intentions of the British Government with regard to Eastern Toorkistan."

forwarded with your letter, No. 407, dated 28th ultimo, and with reference to the passages cited in the margin, I am directed to request that Dr. Cayley may be called upon to furnish the evidence on which these statements are based.

2. His Excellency in Council observes that such statements should not be made lightly, and unless their correctness can be placed beyond doubt by a careful scrutiny of the evidence on which they are founded.

From T. H. Thornton, Esq., Secretary to Government of the Punjab, to the Secretary to the Government of India, Foreign Department, with the Governor General (No. 872-419); dated Camp Dina, 8th November 1867.

I AM directed to forward, for the information of the Supreme Government, extract paragraph 2, of the weekly narrative of the officer on special duty in Ladakh, dated 24th September last.

EXTRACT, paragraph 2, from DIARY of Dr. H. Cayley, on Special Duty, Ladakh; dated 24th September 1867.

Paragraph 2. THE road from Turkistan has at last been opened, and Yakhoo Kush Begi has given permission to all traders to pass, and a large number have already reached Ladakh; and yesterday evening two of them arrived in Lé; they say that more than 1,000 ponies with merchandise are now on their way. This morning I had a long conversation with one of the merchants named Gul Mahomed, who was in Khotan at the time of its capture, and afterwards went to Yarkand, from whence he has now come. He confirms all that I have before related about the war between Yarkand and Khotan, and says that when Kush Begi had seized the Khotan ruler and his sons and all the head men and entered Ilchi, the capital of the country, the people of that city, and of Kharraskash and other towns, and of all the country, joined together to resist him, and were completely defeated, and all the towns and villages were given up to plunder, and about 14,000 were slain, but no women were injured, and the traders were all protected and treated with great consideration, and some who had been robbed during the disturbance were compensated for their losses. Only the agent of the Cashmere Government was fined 50 "Ruins" (nearly 10,000 rupees) for having interfered in politics. Kush Begi sent Habbaboolah Khan of Kholan, and his two sons and grandchildren, and about 80 of the chief men of the place, to Yarkand, and there had them all beheaded; he then went and took Aksu and Kucha, and all the surrounding places. The Tunganis of these two cities joined him, and by their help he easily overthrew the rulers, who, with their followers, were all either killed

or fled away, but the people were not plundered or otherwise injured. Kush Begi is now on his way back to Yarkand, and sent the order beforehand to open all the roads to traders. He seems to be greatly respected for his energy and determination, and for the justice and order that he maintains in his army and in the country generally. The army, which musters about 15,000 men, is said to be regularly and well paid, and kept under most strict discipline, and any man guilty of any violence or oppression is most seriously punished, and thieves and robbers are most seriously dealt with. He is most anxious to promote trade with and through his dominions, and the duties he imposes, viz., 2½ per cent. import and no export duties, are very light.

It is said in Yarkand that both Kokan and Bokhara have submitted to Russia, but have not been occupied; this agrees with the news received by other channels.

Nothing is known of any advance of the Chinese to retake Turkistan, but it is said that the Tunganis and Imperialists are still fighting in North-Western China.

There is every reason to believe that Kush Begi will do his best to keep on friendly terms with the Indian Government, and to advance trade between the two countries, and that great advantages will result from his having made himself master of Khotan and the other countries.

From *T. H. Thornton*, Esq., Secretary to Government of the Punjab, to the Secretary to the Government of India, Foreign Department, with the Governor General (No. 382-808); dated Murree, 17th October 1867.

I AM directed to forward, for the information of his Excellency the Viceroy in Council, extracts, paragraphs 4 and 5, from *Dr. Cayley's diary*, dated 1st instant, together with copy of a postscript attached to the diary, regarding the state of affairs in Eastern Turkistan.

EXTRACTS, paragraphs 4 and 5, from *Dr. Cayley's Diary*, dated the 1st October 1867.

Paragraph 4.—The state of affairs in Eastern Turkistan seems to be as follows:—Yakub Kush Begi is now master of Yarkand, Khotan, Kashgar, Aksu, Ush Turfan, and Kucha, but is nominally a Lieutenant of Khoda Yar Khan, the King of Kokand, to whom all these States own allegiance and pay tribute; but Kush Begi seems inclined to throw off the Kokand yoke and become independent; and, apparently, he has power and resources enough to enable him to do so, as he has completely destroyed or driven out all his enemies in the countries now under him. It is said that he has this year refused to pay the usual annual tribute of 2,000 "Kurus," about 300,000 rupees. He has now with him in his camp, and is treating with great attention and honour, Mahomed Ali Khan, whose father, the former King of Kokand, was killed in battle by the King of Bokhara some 20 years ago, and who himself escaped from captivity in Bokhara a year or two ago, and it is thought that Kush Begi will support this Prince against the present King of Kokand, and try and drive the latter out. If any such dispute were to take place, it is probable that the Russians would step in and assist one side. There seems to be a general feeling of distrust and dislike towards Russia all through Eastern Turkistan, and a determination to resist any further Russian encroachments in that direction; but of course internal disputes would quite prevent any effectual resistance being made. The authority of Kush Begi seems to be submitted to without opposition, and he seems to be both feared and respected for his bravery, justice, and liberality.

5.—A vakeel has just arrived from Yarkand with presents of ponies, silks, silver, &c., from Yakub Kush Begi for the Maharajah of Cashmere. The envoy is an officer of rank in the Yarkand army, named Mahomed Nazar Meer Akhoor; Suddiq Koolie, one of the Maharajah's vakeels at Yarkand, is accompanying him. The envoy, accompanied by the Dewan, paid me a visit this morning. He said that Kush Begi wished to be on friendly relations with the English Government, and was desirous of promoting trade between Yarkand and Hindustan. I explained to him that I was sent here by the British Government to protect the traders from ill-usage, and to see that they were not made to pay excessive duties or undue exactions; and I hoped that the Yarkand ruler would assist in furthering trade, and in rendering the roads safe and free from robbers, and so on.

P. S.—The following intelligence is, I believe, authentic:—Kush Begi has (for a time) made friendly terms with Kokand, and has sent envoys to that place, and to the Tunganis of Ili (Kuldja), and to the King of Bokhara, calling upon them all to join him against the Russians, and telling the Bokhara king that if he will only hold out boldly, they will relieve him in a very short time. Kush Begi is collecting a large army, and soldiers join him from all sides, and has a good supply of guns, ammunition, &c. The cannons have been manufactured under the directions of a number of Sikhs, who, two years ago, returned with the Khotan envoy from the Punjab.

(True Extracts.)

(signed) *T. H. Thornton*,
Secretary to Government, Punjab.

From the Secretary to the Government of the Punjab, to the Secretary to the Government of India, Foreign Department (No. 428-890); dated Camp Baganwala, 14th November 1867.

IN forwarding, for the information of his Excellency the Governor General in Council, extract, paragraph 2, from Dr. Cayley's Narrative from Ladakh, for the week ending 29th ultimo, I am directed to state that the Maharajah of Cashmere has consented to the reduction of transit duties to five per cent. *ad valorem*, and has issued orders to this effect to his officials in Ladakh.

2. I am further to mention that traders from Yarkand bring a report that Yakoob Kush Begi has been assassinated, but this is a mere rumour requiring confirmation.

EXTRACT, paragraph 2, from NARRATIVE of *Dr. Cayley*, on Special Duty, Ladakh, dated 29th October 1867.

Paragraph 2.—Your letter, No. 787, of October 9th, with copies of two letters addressed to the Maharajah, reached me on the 25th. I at once put in force the rule of a five per cent. *ad valorem* duty on all goods passing unopened through Leh, and to those traders still here who had paid the full import duties; pending the result of my reference to you on the subject, I ordered a refund to be made of the amount they had paid in excess of five per cent. Although it is not quite definitely so stated, the meaning of your letter clearly is, that all goods passing through unopened, and which are not for use or consumption in Cashmere territory, should pay the five per cent. transit duty only. The duty is on the goods and not on the owners, and is not affected by the goods changing hands in transit. As a general rule the Yarkandees exchange their merchandise in Leh with the Hindustani merchants, and each party returns with its respective purchases to its own country. All such goods pass unopened through Ladakh (except so far as is necessary to examine samples), and are not for sale or consumption in Cashmere, but remain as it were in bond, and of course such goods come under this rule, and in this spirit I have applied it. The merchants, of whom there are many now in Leh, came forward to me in a body to hear the transit duty explained, and nothing can exceed their gratitude at this boon being granted them. One man had to pay only 50 rupees, instead of 800 rupees duty; and, as a rule, they had only to pay one-sixth of the previous amounts. It is fortunate that so many of the Yarkandees are still here, as they now see what has been done for them, and all say that there will be no limit to the trade in future years.

(True Extract.)

(signed) *E. W. Trotter*,
 Officiating Assistant Secretary to Government,
 Punjab.

From the Foreign Secretary to the Government India, to the Secretary to Government of the Punjab (No. 1160); dated Fort William, 29th November 1867.

IN reply to your letter, No. 428-890, dated 14th instant, submitting an extract from Dr. Cayley's Narrative from Ladakh, for the week ending 29th ultimo, I am directed to state that the liberal action of the Maharajah of Cashmere in reducing the transit duties to five per cent. *ad valorem*, is duly appreciated by the Governor General in Council.

From *T. H. Thornton*, Esq., Secretary to Government of the Punjab, to the Secretary to the Government of India, Foreign Department, with the Governor General (No. 837-395); dated Murree, 24th October 1867.

IN continuation of my letter No. 371-786, dated 9th instant, and its enclosure, on the subject of interference exercised at Ladakh with trade from Yarkand and Turkistan with British territory, I am directed to forward, for the information of his Excellency the Viceroy in Council, extracts, paragraphs 1, 2, and 3 from Dr. Cayley's diary, dated 8th instant, regarding the state of trade in Ladakh and the presence of a Russian envoy at Kashgar.

EXTRACTS, paragraphs 1, 2, and 3, from DIARY of *Dr. Cayley*, on Special Duty, Ladakh, dated 8th October 1867.

Paragraph 1.—THE accompanying tables show the extent of the trade through Ladakh during the past month. The imports at the Punjab rates have amounted to nearly 36,000 rupees in value, and on the spot are worth nearly double that sum; and goods to the value of 23,000 rupees have been exported. Merchants are still arriving both from Yarkand and the Punjab.

2. The Yarkandi merchants, who are coming in large numbers, chiefly, as I have before mentioned, in consequence of having heard that a British officer was stationed here, and that the duties were lowered, are now thoroughly disgusted at finding the old extravagant duties still in force, and they will never return here unless some reduction is made this year. The exorbitant import and export duties on goods from Yarkand, amounting to over 30 per cent., must destroy all trade by private individuals, and will again throw it all into the hands of a favoured few.

I am convinced from all I hear that English goods would entirely beat Russian goods out of the field in Eastern Turkistan, and would probably soon find their way to Western China. All the merchants say they could supply English goods from Bombay and Calcutta cheaper and of better quality than any that came from Russia if only the Ladakh transit duties were lowered; and there is no doubt that reducing these duties would vastly increase the revenue that the Maharajah derives from customs after a very short time, even so soon as next year. I am most anxious for an early reply on the subject of the transit duty to be imposed on goods from Yarkand passing unopened through Ladakh, for the future of the trade almost depends on this point being at once settled in favour of the traders.

3. I have no further news to give of Central Asian events, but a Russian envoy has been sent to Kashgar, and is there awaiting the return of Kush Begi.

(True Extract.)

(signed) *T. H. Thornton,*
Secretary to Government, Punjab.

(No. 21.—Political.)

Sir Stafford Northcote, Bart., to the Governor General of India in Council.

India Office, 15 February 1868.

1. THE enclosures to your Excellency's letter in the Foreign Department, No. 177, of the 7th December 1867, contain much interesting information relating to the commerce and politics of Central Asia; but the only subject which calls for any notice from Her Majesty's Government is that to which you have especially invited my attention, namely, the "restrictions imposed by the Cashmere authorities at Ladakh upon the trade between Eastern Toorkistan and British India."

2. The general sentiments of Her Majesty's Government, with respect to the conduct of native chiefs in maintaining illiberal systems of commercial policy, have been communicated to you in my Despatch of the 30th of March 1867, and I regret to observe that the instructions therein contained, with reference to the course to be pursued towards them in the event of their imposing duties on transit through their dominions unfavourable to British trade, have not been sufficiently regarded by the authorities of the Punjab. The peremptory tone of the letter addressed by the Secretary of the Punjab Government (not, as is usual, by the Lieutenant Governor himself) to the Maharajah on the 23rd of October, is neither in conformity with the views which I have communicated to your Excellency's Government, nor consistent with the courtesy and respect which should be shown to an independent Prince in the position of the ruler of Cashmere.

3. I observe that the Maharajah has finally agreed to an *ad valorem* duty of 5 per cent. on all goods passing unopened through Leh; and I trust that, having consented to this liberal measure, his Highness will adhere to it, and that he will eventually find that the increased development of trade is advantageous to the interests of his own country. I hope, however, that there will be no undue interference on the part of any of your officers (such as is apparently indicated in Dr. Cayley's letter of the 29th of October) in enforcing these regulations.

Extract from Despatch of the 30th March 1867.—No. 50.

2. HER Majesty's Government have learnt, from official and other quarters, that complaints of the commercial policy of the Native Princes of India are of frequent occurrence; that there is a general tendency on their part to maintain high transit duties, which are necessarily disadvantageous to our own subjects and to our own Government. The sentiments of Her Majesty's Government have

recently been communicated to you with respect to the proceedings of the King of Burmah and the Maharajah of Cashmere. In the present instance, the complaint suggests special considerations in connection with the passage of our railways through the territories of Native Princes, undertakings which, I fear, are still regarded by them with much suspicion and distrust. But in addition to these feelings, which time will probably assuage, there can be little doubt that it is the material loss of revenue, unaccompanied with benefits very directly affecting their own subjects, that Native Princes most regard. Every care, in such a case, should be taken to render these enterprises as little obnoxious as possible to the native durbars, and if concessions are required injurious to the finances of the State, some corresponding advantage should be granted to the native chief to reconcile him to the loss which he sustains.

(No. 23.—Foreign Department.—Political.)

The Governor General of India in Council to the Secretary of State for India, dated Fort William, 6 February 1868.

WE have the honour to forward, for the information of Her Majesty's Government, copy of a correspondence with the Punjab Government, showing the satisfactory result of Dr. Cayley's medical operations in Ladakh during the past year.

(No. 28-18, dated 9th January 1868.)

From the Secretary to the Government of the Punjab, to the Secretary to the Government of India.

I AM directed by the Honourable the Lieutenant Governor to forward, for submission to his Excellency the Viceroy, copy of a letter dated 23rd ultimo, from Dr. Cayley, reporting the results of his medical operations in Ladakh during the past year.

2. In the Lieutenant Governor's opinion the Report appears a very appropriate and satisfactory one, and the results of the season's operations are on the whole gratifying and creditable to Dr. Cayley.

3. On the receipt of your reply, the Lieutenant Governor proposes to publish the Report in the "Punjab Gazette" for general information.

(Dated 23rd December 1867.)

From *Henry Cayley*, Esq., on Special Duty, to Officiating Secretary to the Government of the Punjab.

IN compliance with your letter No. 960, dated 3rd December, I have the honour to submit the following Report, showing the result of my medical operations in Ladakh:—

2. I reached Le on the 24th June, and at once opened a dispensary; that is to say, I let people know that all applicants would receive medical treatment. I was accompanied by a hospital compounder as a native doctor, and had brought up with me a small supply of what I supposed would be the most useful medicines and instruments.

3. During the first few days patients began to come freely, and then the attendance suddenly ceased, or was confined to the sepoys and other servants of the Government. This was owing, as I represented in my Reports at the time, to the orders of the Dewan and local officials, who endeavoured to prevent any one from coming near me; but on my vigorously protesting against such opposition, the obstructions were removed, and the sick again attended freely.

4. Early in July, when the small bungalow was ready for my reception, I gave up a room for the native doctor and for seeing out-patients; and after another month I commenced to make use of some of my tents for the accommodation of in-door patients; chiefly operation cases.

5. The

5. The following Tables show the attendance of sick during each month, the principal diseases that came under treatment, and the number of admissions under each disease :—

	June 25th to 30th.	July.	August.	September.	October to Nov. 6.	TOTAL.
Admissions - - -	22	239	149	120	129	659
Daily average of sick -	6	30	29	26	22	27.5

DISEASES.

Fevers - - - - 92	Skin diseases - - - 10	Dyspepsia - - - - 99
Ophthalmia - - - 64	Paralysis - - - - 8	Hepatitis - - - - 1
Diarrhoea - - - - 3	Epilepsy - - - - 5	Caries of teeth - - - 39
Dysentery - - - - 7	Cephuloea - - - - 3	Abscess - - - - 7
Throat diseases - - - 8	Deafness - - - - 11	Ulcer - - - - 20
Rheumatism - - - - 57	Cataract - - - - 14	Accidents - - - - 19
Neuralgia - - - - 23	Amaurosis - - - - 2	Erysipelas - - - - 1
Venereal diseases - - - 69	Staphyloma - - - - 3	Piles - - - - 2
Scurvy - - - - 9	Entispiion - - - - 6	Ascarides - - - - 1
Scabies - - - - 3	Bronchitis - - - - 28	Frost Bite - - - - 2
Tumours - - - - 11	Colic - - - - 16	Other diseases - - - 17

As shown in the foregoing list, fever cases were numerous, but were nearly all of the form of simple continued fever, depending usually upon cold, fatigue, exposure to the sun, and similar causes. Amongst the pilgrims, merchants, and others coming from the plains, there were, however, many cases of severe remittent and intermittent fever. In Ladakh itself, and among the people of the country, malarious fever seems almost, if not quite, unknown.

Chronic ophthalmia is very prevalent, and is the cause of loss of sight in many cases, this result being chiefly due to want of treatment and care.

Amongst the people of the country diarrhoea and dysentery are almost unknown; the cases that came for treatment were nearly all amongst pilgrims and traders from other countries.

Chronic rheumatism is very prevalent among the Ladakis, and gives rise to great and protracted suffering; the causes seem to be insufficient food and clothing, exposure to cold, constantly working in the wet whilst irrigating the fields; and the disease is frequently accompanied by a tendency to scurvy. Neuralgic affections, which are also very common, seem to depend on the same causes.

Venereal affections are everywhere prevalent, and the sepoys of the Le garrison suffer to a great degree; but the diseases of this class are not generally of a very malignant type; less so than in the plains of India.

Skin diseases generally are very rare, and scabies, in spite of the dirty habits of the people, is almost unknown.

Scurvy, or rather a scorbutic tendency, is very general, and accompanies many of the other diseases. This is owing to the poor diet on which the people generally live, and the absence of fruit and fresh vegetable in their food during the greater part of the year.

Cancerous diseases are not uncommon, and several cases attended at the dispensary for treatment. Cataract prevails to a great degree, and 14 patients with this disease applied for relief, in most of which I performed the operation of extraction.

Other diseases of the eyes, leading to ultimate blindness, are frequently met with.

Bronchitis and lung diseases are very rare among the Ladakis. There were a good many cases of bronchitis among merchants and other strangers, but they were seldom severe, notwithstanding the severity of the climate, the extreme dryness of which seems to counteract the effects of the cold. I did not see or hear of a single case of pulmonary consumption.

Amongst the people of the country dyspepsia is one of the most prevalent and troublesome complaints, and gives rise to great and long-continued suffering. It is most undoubtedly due to the unvarying and indigestible diet of the people, who in a great measure live on masses of uncooked dough made out of "suttoo," or flour of parched grain.

Sufferers from toothache and decayed teeth were very numerous, and always came forward with the greatest readiness to have the painful tooth extracted, bearing the pain of the operation with the most stoical indifference.

Accidents presented nothing unusual; severe contusions from kicks by horses were very frequent among the Yarkandis. Many of the Yarkand horses refuse to be shod unless they are first thrown down and their legs firmly tied, and in this process many severe blows are received.

The diseases, stone in the bladder, leprosy, goitre, and scrofula, which are so common in the lower ranges of the hills, and which one would expect to find in Ladakh, are almost, if not quite, unknown.

6. *Operations.*—The principal operations performed were the following :

I. *Cataract.*—The operation of extraction was performed in 12 cases, generally by the method of linear section, so strongly advocated by Dr. Macnamara in Calcutta. Of the 12 cases, in seven fair sight was restored, three were doubtful, and in two the eyes were quite lost by inflammation. The performance of this operation, by which sight was restored to the blind, made a great impression on the people, and on my return journey the blind were brought from all sides to meet me on the road, though, of course, I could not then perform such an operation. Another year all these cases would be ready to go into Le for treatment.

II. *Entropion*, or growing inwards of the eyelids and eyelashes, which is generally the result of neglected ophthalmia, I found a very common affection. It is one that causes constant and acute pain and irritation, and frequently in time leads to blindness and destruction of the eye. I operated in 11 cases by the usual method of removing a fold of skin and muscular fibre from the affected eyelid, and the cure was in every case complete.

Operations for the removal of tumours were performed in five cases ; some of the tumours were cancerous.

Besides the above, many minor operations were performed.

7. The climate of Ladakh, at the altitude of Le, about 11,500 feet above the sea, is, during the summer months, most delightful and remarkably healthy.

The air is always dry and bracing, never hot in the shade, though pleasantly warm. The weather is almost uninterruptedly fine ; the rain-fall during the four or five months is not above three inches, and there are very few cloudy days.

During the months of July and August the readings of the thermometer in the shade were as follows :

Maximum	-	-	-	80°	Minimum	-	-	-	42°
Average maximum	-	-	-	72°	Average minimum	-	-	-	49°

In the sun's rays an ordinary thermometer rose to 136°.

During September.

Maximum	-	-	-	65°	Minimum	-	-	-	36°
Average maximum	-	-	-	60°	Average minimum	-	-	-	38°

In the sun - - - 127°

During October and first week of November.

Maximum	-	-	-	58°	Minimum	-	-	-	18°
Average maximum	-	-	-	40°	Average minimum	-	-	-	22°

In the sun - - - 102°

During winter the climate is very severe and extremely cold. Even in October there were slight falls of snow in the valley of Le, and in the beginning of November the whole valley of the Indus was covered with snow two or three inches deep.

8. Of the patients, 532 were male and 126 female ; there were only 10 children under 12 years of age. There were patients from almost every race and people, either dwelling in or passing through Ladakh, as shown in the following list :—

Ladakis	-	-	-	-	-	-	-	-	-	260
Bultistanis	-	-	-	-	-	-	-	-	-	84
Yarkandis or Turkis	-	-	-	-	-	-	-	-	-	71
Cashmiris	-	-	-	-	-	-	-	-	-	45
Argoons, or half-breed between Cashmiris and Ladakis	-	-	-	-	-	-	-	-	-	49
Sepoys of Le Garrison	-	-	-	-	-	-	-	-	-	97
Men from Lhassa	-	-	-	-	-	-	-	-	-	5
Men from Kulu and Lahoul	-	-	-	-	-	-	-	-	-	14
Cabulis	-	-	-	-	-	-	-	-	-	3
Hindustanis	-	-	-	-	-	-	-	-	-	35
Others	-	-	-	-	-	-	-	-	-	5

Of the total number, 138 were traders and 37 pilgrims from Central Asia.

This varied list proves that the dispensary was appreciated, and there was no prejudice felt against European treatment. One man came all the way from Yarkand for the sole purpose of receiving medical treatment for a chronic disease.

9. Considering the circumstances under which the dispensary was established, that it was newly introduced amongst an ignorant people unused to our customs, and who had to discover for themselves that they derived any benefit by attending, that the Ladakis are extremely poor and with difficulty able to leave their work, however ill they may be, and many of those who did attend were carried off to perform enforced labour, and that for a long time there was the general impression abroad among the people that the Cashmere official would be offended at their attending the dispensary—considering all these circumstances, I think that the results of the medical operations in Ladakh have been on the whole successful, and have certainly been the means of relieving much suffering. I may add,

add, too, that the opportunity the dispensaries afforded me of communicating with the traders and others, and of conversing freely with them, were very great, and this I found of the greatest advantage in enabling me to pick up information; and there is no doubt that the merchants have many of them returned to Central Asia, feeling a very lively gratitude for the benefits they have received; and such a feeling is calculated to spread abroad a spirit of friendship towards India among the races beyond the Himalayas, and thus indirectly promote future trade.

10. The hospital compounder, Khuda Buksh, who acted in the capacity of native doctor, has done his duty with zeal and activity, and to my entire satisfaction. He has by hard work picked up a very fair knowledge of the Boti language, and thus greatly increased his usefulness.

(No. 116, dated 31st January 1868.)

From the Secretary to the Government of India, to the Secretary to Government
of the Punjab.

I AM directed by his Excellency the Governor General in Council to acknowledge your No. 28-18, of the 9th current, submitting copy of Dr. Cayley's Report on dispensary operations at Le in Ladakh.

2. The results set forth appear to be highly creditable to Dr. Cayley's professional zeal and humanity. The good hereby effected in those remote regions will extend even beyond the physical benefits conferred.

3. These interesting papers will be published in the Supplement to the "Gazette of India."

EAST INDIA (LADAKH).

COPY of CORRESPONDENCE between the Secretary of State for *India* and the Governor General in Council, relating to the Appointment of a COMMERCIAL AGENT in *Ladakh*, and to his Proceedings there.

(*Lord William Hay.*)

Ordered, by The House of Commons, to be Printed,
16 March 1868.

RETURN to an Address of the Honourable The House of Commons,
dated 26 June 1868;—for,

“ COPY of CORRESPONDENCE between the Secretary of State for India and
the Bombay Government, relative to the proposed PURCHASE by the
INDUS FLOTILLA of the STEAMERS belonging to the ORIENTAL STEAM
COMPANY.”

India Office, }
29th June 1868. }

W. T. THORNTON,
Secretary, Public Works Department.

(Lord William Hay.)

Ordered, by The House of Commons, to be Printed,
14 July 1868.

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COPY of CORRESPONDENCE between the Secretary of State for India and the Bombay Government, relative to the proposed PURCHASE by the INDUS FLOTILLA of the STEAMERS belonging to the ORIENTAL STEAM COMPANY.

-- No. 1. --

(Railway, No. 14.)

RAILWAY DESPATCH from Secretary Sir *Stafford Northcote* to the Governor in Council at *Bombay*.

Sir,

India Office London, 18 May 1867.

1. HERewith is transmitted copy correspondence with the Indus Flotilla and the Oriental Inland Steam Navigation Companies, regarding a proposed purchase by the former of the vessels and other property of the latter.

2. You will observe that, provided your Government consider the property in question will be worth so much to the Flotilla Company, I have intimated that Her Majesty's Government are prepared to sanction its purchase by them for the sum of seventy-five thousand pounds (75,000 *l.*), payment to be made in fully paid up shares of the Flotilla Company at par.

I have, &c.

His Excellency the Right hon.
The Governor in Council, Bombay.

(signed) *Stafford H. Northcote.*

Enclosure 1, in No. 1.

(No. 2418.)

Indus Steam Flotilla Office,
Gresham House, Old Broad-street, London,
23 January 1867.

Sir,

WITH reference to the position of the Indus Steam Flotilla in respect to the competition to which it is exposed from the vessels belonging to the Oriental Inland Steam Navigation Company (and to previous correspondence and communications upon this subject), I have the honour to forward copies of letters from the board of that Company, from which it will be seen that they are desirous of withdrawing from the river, provided the Indus Steam Flotilla would be prepared to enter into an arrangement for taking over their vessels, property, and stores.

2. The terms upon which the Oriental Inland Steam Navigation Company have based their proposals for the transfer are as follows:—

“1st. That the Agents of the respective companies in India shall be instructed to proceed to a valuation of the plant, stores, land, and other property of the Oriental Inland Steam Navigation Company,” as described,* “taking into account in such valuation the cost of transport, and the re-erection of the vessels in India, the enhanced value of stores and other property shipped to that country, and in particular the good-will of the business established upon the river Indus; and that such valuation shall be accepted as final and binding in all cases of agreement between the Agents of the respective companies.

“2nd. That all cases in which the Agents cannot agree in valuation, shall be referred to the Directors of the respective companies in London, and that in the event of further disagreement, the decision of an arbitrator, approved by both parties, shall be considered final and binding.

“3rd. That

*Dated 15th and
17th January.*

* “The steamers, barges, land, buildings, stores, and all other property belonging to the Oriental Inland Steam Navigation Company at Kurrachee, Manora, Kotree, and on the line of the river Indus.”

"3rd. That the expense incurred in the formation of establishments, creating agencies, and generally in placing the Oriental Inland Steam Company in its present position on the River Indus, shall be taken into account in the valuation.

4th. "That payment for the property and good-will of the Company, when valued, shall be made in Indus Steam Flotilla Company's Stock at par."

3. There is a second proposal that the whole of the vessels, property, stores, &c., should be taken over by the Indus Steam Flotilla on payment of a specific amount, 200,000 £., being named by the Oriental Inland Steam Navigation Company. This sum is, however, in the opinion of the board, greatly in excess of the present value of the Oriental Inland Steam Company's property, which cannot be worth more than from 70,000 £. to 100,000 £., and the board are therefore not prepared to entertain this offer.

4. The Directors are, however, prepared to entertain the first proposal for the transfer on a valuation; or, are ready to negotiate with the board of the Oriental Inland Steam Company in this country (after communication with their agent and superintendent, Captain Wood) for the payment of the lowest sums (not exceeding 100,000 £.) they find will be accepted, in Indus Steam Flotilla Stock, should either of these courses meet with the favourable consideration of the Secretary of State for India in Council.

5. The vessels of the Oriental Inland Company have interfered materially with the profitable working of the Flotilla by reducing the rates of freight below the standard which otherwise might have been maintained. The following table will, however, show that even with the disadvantage of a sustained competition the working of the Flotilla has been far from unprofitable, and the directors have every reason to believe that were this competition removed the return would show most favourably. It should be remembered that the results shown below have been attained with a very inefficient fleet, some of the vessels having been worked at a loss in order to maintain uninterrupted communication:—

Earnings of the Fleet since the Vessels commenced Running in 1862.

Period.				Gross Earnings.			Working Expenses.			Net Receipts.		
				£.	s.	d.	£.	s.	d.	£.	s.	d.
8 months to	31 December	-	1862	27,024	-	7	23,449	6	3	3,574	14	4
6 "	30 June	-	1863	29,674	11	9	18,214	12	9	11,459	19	-
6 "	31 December	-	"	35,032	16	8	22,643	5	3	12,389	11	5
6 "	30 June	-	1864	52,171	13	2	29,907	7	2	22,264	6	-
6 "	31 December	-	"	40,094	3	7	27,998	5	10	12,095	17	9
6 "	30 June	-	1865	33,864	9	10	29,500	12	3	4,363	17	7
6 "	31 December	-	"	41,826	2	7	31,042	17	6	10,783	5	1
6 "	30 June	-	1866	35,184	19	6	26,712	19	4	8,472	-	2
TOTAL - - - £.				294,872	17	8	209,469	6	4	85,403	11	4

6. It is believed that the vessels now on the river belonging to the Oriental Inland Company are good serviceable vessels, and that they would prove an acquisition to the Flotilla.

7. I have to request that you will do me the favour to submit the foregoing for the consideration of Lord Cranborne.

I am, &c.
(signed) *W. P. Andrew*, Chairman.

The Under Secretary of State
for India, &c. &c. &c.

Enclosure 2, in No. 1.

Oriental Inland Steam Company (Limited),
6, Billiter-street, London, E.C.,
15 January 1867.

Sir,

REFERRING to the communications which have taken place between yourself and Mr. Rogerson, the Chairman of this Company, I am now instructed to inform you that the directors are prepared, subject to the consent of the shareholders, to transfer to the Indus Steam Flotilla Company the steamers, barges, land, buildings, stores, and all other property belonging to the Oriental Inland Steam Company, at Kurrachee, Manora, Kotree, and on the line of the River Indus, upon the following conditions:—

1. That the Agents of the respective companies in India shall be instructed to proceed to a valuation of the plant, stores, land, and other property of the Oriental Inland Steam Company, as above described, taking into account, in such valuation, the cost of transport and re-erection of the vessels in India, the enhanced value of stores

stores and other property shipped to that country, and in particular, the good-will of the business established upon the River Indus; and that such valuation shall be accepted as final and binding in all cases of agreement between the Agents of the respective companies.

2. That all cases in which the Agents cannot agree in valuation shall be referred to the Directors of the respective companies in London; and that, in the event of further disagreement, the decision of an arbitrator, approved by both parties, shall be considered final and binding.

3. That the expense incurred in the formation of establishments, creating agencies, and generally in placing the Oriental Inland Steam Company in its present position on the River Indus, shall be taken into account in the valuation.

4. That payment for the property and good-will of the Company, when valued, shall be made in Indus Steam Flotilla Company's stock at par.

W. P. Andrew, Esq.,
Chairman, Indus Steam Flotilla Company.

I am, &c.
(signed) Robert Wilson,
Secretary.

Enclosure 3, in No. 1.

Oriental Inland Steam Company (Limited),
6, Billiter-street, London, E.C.,
17 January 1867.

Sir,

REFERRING to my letter of the 15th instant, relating to the transfer, upon certain conditions, of the property of this Company on the River Indus to the Indus Steam Flotilla Company, I am desired to request the favour of your special attention to the circumstance that the Oriental Inland Steam Company has expended a considerable amount of money, which is unrepresented by property, in establishing itself on the River Indus, thus contributing largely to the development of the resources and commerce of Western India, without having enjoyed in the way of compensation, during the 10 years of its existence, any privileges, or received any favours from the Government of India, notwithstanding the expectation more than once held out that such would be conceded.

I need not, I think, remind you that this has been a frequent source of complaint in past years, and that repeated applications have been made by the Company to the authorities for some consideration in acknowledgment of the enterprise displayed, and the services actually rendered by it to the interests of India.

In the prosecution of this undertaking the Oriental Inland Steam Company has expended a capital exceeding 400,000 £; and it appears to the directors that, if the Government of India would sanction the payment of 200,000 £. for the steamers, barges, lands, buildings, stores, and all other property, together with the good-will and business connection of this Company on the Indus, the arrangement would be advantageous to the interests of the Indus Steam Flotilla Company in removing a formidable competitor from the river, while it would not do more than enable the Directors of the Oriental Inland Steam Company to return about 4 £. for every 10 £. share to the proprietors, involving a loss to them, even upon these terms, of nearly 60 per cent. in capital alone, leaving the non-receipt of dividends out of the question, upon the amount they had subscribed towards an undertaking entered upon for the promotion of the commerce and prosperity of India.

W. P. Andrew, Esq.,
Chairman, Indus Steam Flotilla Company.

I am, &c.
(signed) Robert Wilson,
Secretary.

Enclosure 4, in No. 1.

Sir,

India Office, 28 February 1867.

I AM directed by the Secretary of State for India to acknowledge receipt of your letter of the 23rd ultimo, No. 2418, relative to negociations which have taken place between the Indus Flotilla Company and the Oriental Inland Steam Navigation Company, with a view to the withdrawal of the latter from the River Indus, and the transfer of their vessels, stores, and other property to the former Company.

In reply, I am to state that Lord Cranborne cannot sanction either of the arrangements proposed by the Oriental Inland Steam Navigation Company.

He entirely disapproves of the principle on which they desire that their property should

be valued, and he cannot permit a valuation by the Agents of the two Companies to be regarded as final.

He also quite agrees with the Directors of the Indus Flotilla Company that the sum of 200,000*l.* is probably very much more than the property is worth.

He is, however, prepared to sanction the purchase of the Oriental Inland Steam Navigation Company's property at any price, not exceeding 75,000*l.*, of which the Bombay Government may approve, provided that the Company will accept payment in fully paid-up shares (at par) of the Flotilla Company, specially created for the purpose, and bearing guaranteed interest at the usual rate of 5 per cent. per annum.

W. P. Andrew, Esq.

I am, &c.
(signed) *James Fergusson.*

Enclosure 5, in No. 1.

(No. 2471.)

Indus Steam Flotilla Office,
Gresham House, Old Broad-street, London,
20 March 1867.

Sir,

WITH reference to a correspondence which has recently taken place in regard to a proposed transfer of the vessels and other property of the Oriental Inland Steam Navigation Company on the Indus to the Indus Steam Flotilla, I have the honour to enclose, for the information of the Secretary of State for India in Council, copy of a letter addressed by the Acting Secretary of this Company to the Secretary of the Oriental Inland Company on the 6th instant, together with copy of the reply of the latter, dated the 15th instant.

It will be observed that the proposals of the Oriental Inland Steam Company, even as now modified, are such as cannot be entertained by this Company under the decision of the Secretary of State, communicated in Sir James Fergusson's letter of the 28th ultimo; and I accordingly now beg to enclose draft of a letter which it is proposed to address to the Secretary of the Oriental Inland Steam Company upon the 23rd instant, unless any communication should be received from you before that date of such a nature as might appear to hold out a prospect of the question being re-considered.

The Under Secretary of State
for India.

I am, &c.
(signed) *W. P. Andrew, Chairman.*

Enclosure 6, in No. 1.

Indus Steam Flotilla Office,
Gresham House, Old Broad-street, London,
6 March 1867.

Sir,

WITH regard to your letters of the 15th and 17th January, proposing terms for the transfer of the property of the Oriental Inland Steam Company to the Indus Steam Flotilla, I have to state that the Directors, having had the matter under their consideration, are unable to concur in either of the arrangements for a transfer detailed in your letters under reference.

The Directors would, however, be prepared to purchase the vessels and property of the Oriental Inland Steam Company at such a price, not exceeding seventy-five thousand pounds (75,000*l.*), as might be approved by the Bombay Government, payment being made in Indus Steam Flotilla Stock at par.

Should your Directors be disposed to entertain this proposal, my Board would be prepared to instruct their Agent to place himself in communication with your representative at Kurrachee, with a view to give effect to the arrangement.

Robert Wilson, Esq., Secretary to
the Oriental Inland Steam Company, &c.

I am, &c.
(signed) *Sidney H. R. Parry,*
Acting Secretary.

Enclosure 7, in No. 1.

Oriental Inland Steam Company (Limited),
6, Billiter-street, London, E.C.,
15 March 1867.

Sir,

IN reference to your letter of the 6th instant, I am instructed to express the regret of this Board that neither of the arrangements for the transfer of the property of this Company to the Indus Steam Flotilla, proposed in my letters of the 15th and 17th January last, have met with the concurrence of the Directors of the latter Company.

In order, if possible, to meet the views of your Company, I am to state that the Directors of this Company accept the basis of the counter-proposal contained in your letter now under reply, and that they are prepared to transfer the entire plant, property, and trade interest of the Company on the Indus (including the steamer "Oobarah," subject, as already explained, to the payment by the Indus Steam Flotilla of the balance of the purchase-money due to the Bombay Government thereon) for such a sum, not exceeding one hundred and fifty thousand pounds (150,000 £.), and not less than one hundred thousand pounds (100,000 £.), as may be approved by the Bombay Government, payment being made in Indus Steam Flotilla Stock at par.

The Directors of this Company have had some difficulty in bringing themselves to name so low an amount, which after their long struggle cannot fail of being exceedingly disappointing to the shareholders; and in making this offer they feel that they are consenting to a very great sacrifice, apart from receiving no consideration for the value of the Company's position on the river.

The average returns of the last two years, unfavourable as these years have been, show that the net earnings of the Company, added to the agency office and general expenditure in London and India, have amounted to about 11,000 £. a-year. This is mentioned to show the benefit which the Indus Steam Flotilla would acquire by the purchase, without taking into account the increase in the rates of freight which the cessation of opposition would effect; an increase probably equal to a further additional profit of 10 per cent., or fully 10,000 £., on the annual returns of the united companies. On this subject it may also be remarked that the returns of this Company during the past year exhibit a large increase upon those of the year preceding, and that the agent has entered into a contract which will give full-up freights to the Company's vessels during the present year.

The directors will feel obliged by the favour of a reply at your earliest convenience, if possible before the 23rd instant, as the annual meeting of the shareholders has been already postponed, pending negotiations, and cannot be much longer deferred, and as some definite conclusion must be laid before the proprietary when the meeting is held.

I am, &c.
(signed) *Robert Wilson*, Secretary.

P.S.—In reference to the explanation respecting the "Oobarah," stated to have been given, I refer to the sum of 2,500 £. set down in the schedule of the property of this Company as being the first instalment of the purchase-money of this vessel which had been paid to the Government.—(signed) *R. W.*

Sidney H. R. Parry, Esq.,
Acting Secretary, Indus Steam Flotilla, Gresham House.

Enclosure 8, in No. 1.

DRAFT LETTER to *Robert Wilson*, Esq., Secretary, Oriental Inland Steam Company.

Indus Steam Flotilla Office,
Gresham House, Old Broad-street, London,
23 March 1867.

Sir,

I HAVE to acknowledge the receipt of your letter of the 15th instant, and in reply to state that the letter which I addressed to you upon the 6th instant was written after communication with the Secretary of State for India in Council; and I have now to inform you that the directors of this Company are precluded from concluding the proposed negotiation with the Oriental Inland Steam Navigation Company on other terms than those stated in my communication of the 6th instant.

I am, &c.
(signed) *Sidney H. R. Parry*,
Acting Secretary.

Enclosure 9, in No. 1.

Sir,

India Office, 28 March 1867.

I AM directed by the Secretary of State for India to acknowledge receipt of your letter of the 20th instant, No. 2471, enclosing draft of a reply which the directors of the Indus Flotilla Company proposed to make to a letter from the directors of the Oriental Inland Steam Navigation Company, respecting a proposed transfer to the former Company of the vessels and other property of the latter.

Sir Stafford Northcote approves of the proposed reply.

W. P. Andrew, Esq.

I have, &c.
(signed) *James Fergusson.*

Enclosure 10, in No. 1.

Oriental Inland Steam Company (Limited),
6, Billiter-street, E. C.,
25 April 1867.

Right Honourable Sir,

IN reference to the negotiations for the transfer of the property of this Company to the Indus Steam Flotilla, I have the honour to inform you that application has been made to the Directors of the latter Company to grant one month's extension of the time allowed to the Oriental Inland Steam Company for arriving at a decision upon the terms proposed to its acceptance.

The Directors trust the reply of the Indus Steam Flotilla to this request will be in the affirmative; meanwhile, they are desirous that the Secretary of State for India in Council should be informed that the main ground on which they urge this point is the expected arrival of Sir Bartle Frere in England shortly, and the importance they attach to his judgment in the matter now under consideration.

The operations of the Company having been carried on in the Presidency of which Sir Bartle Frere has been the Governor, and his Excellency having recently gone so minutely into the history and position of the Company, the Directors believe that his presence will materially contribute to a just appreciation of the facts of the case.

They therefore respectfully request, Right honourable sir, that you will be pleased in Council to sanction the extension of time asked for.

I have the honour further to ask that the accompanying Memorandum may receive the favourable consideration of yourself and of the members of your Honourable Council.

The Right Honourable
Sir Stafford Northcote, Bart., M.P.,
Secretary of State for India in Council.

I have, &c.
(signed) *Robert Wilson, Secretary.*

Enclosure 11, in No. 1.

MEMORANDUM bearing upon the position of the Oriental Inland Steam Company in relation to the Government of India.

1. THAT the Company was formed in the year 1856, having a contract with the East India Company, whereby the Company was to receive, under certain conditions, a subsidy of 5,000 *l.* a year for ten years.

2. That owing to the inability of the Company through adverse circumstances of various kinds, to fulfil the main conditions of the contract, the subsidy was declared by the Government of India to have been forfeited after payment of the instalment for the first year.

3. That shortly after this contract had been ratified between the Company and the Honourable the East India Company, the formation of the Indus Steam Flotilla, with guaranteed capital to the extent of 250,000 *l.*, was sanctioned by the Government of India.

4 That the Company has felt constrained on many occasions to represent to the Government of India the serious disadvantage at which it has been placed in having to compete on the River Indus with a company having 5 per cent. interest guaranteed to the proprietary, and supported by all the interest and patronage of the Government of India.

5. That, besides other occasions, this was specially the case when, in the year 1862, the Government consented, in order to supply a deficiency in vessels caused by the failure of those

those specially constructed for the Indus Steam Flotilla, to hand over its flotilla of steamers and barges on the Indus to that company, taking in payment for the same the stock of the company; thus accepting in payment for the property of the Government the stock of a company, the interest on which the Government itself undertook to guarantee; the Government by this means becoming in effect a partner in the undertaking. That since that time the Government has consented to a further extension of the capital, with interest guaranteed, until it has reached no less an amount than 500,000 £.

6. That the Agent of this Company has frequently asked that its vessels should be allowed to share with the Indus Steam Flotilla in the carriage of commissariat stores, munitions of war, and other materials belonging to the Government of India; and that the Commissioners in Sind have invariably replied that they deemed it their duty to give the carriage of these to the company guaranteed by the Government in all cases where the vessels of that Company were able to carry them.

7. That until the spring of last year the Indus Steam Flotilla was bound by the Government to carry no goods under a certain fixed minimum rate of freight, thus affording protection to the Government and to the shareholders of that Company that actual loss should not be sustained, and securing the Oriental Inland Steam Company against being run off the river under the protection of the guarantee.

8. That in the year 1866 this prohibition was removed by the Government, the consequence of which has been great fluctuation and reduction in the rates of freight seriously embarrassing to the Oriental Inland Steam Company, because its losses from this cause must be borne by the shareholders, while those of the Indus Steam Flotilla are unfelt by the shareholders, the guaranteed interest being regularly furnished by the Government, irrespective of the profit or loss made by the Company.

9. That it is not in principle just that a private undertaking, in which a large amount of British capital has been invested, should be placed in a position of such serious disadvantage by the action of the Government of the country in which this capital is employed; and further, that it is inexpedient and unnecessary that this should be the case, inasmuch as owing to excessive competition neither Company is now realising an adequate return for its expenditure, while the Native merchants are reaping the profits which are due to British enterprise.

10. That the result of this policy could scarcely fail to show itself eventually in the ruin of the Oriental Inland Steam Company.

11. That in consideration of the many privileges extended to the Indus Steam Flotilla, application has been frequently made, without effect, to the Right honourable the Secretary of State for India, to consent to the payment of the subsidy, originally guaranteed to the Oriental Inland Steam Company; and that, so recently as the early part of last year, His Excellency Sir Bartle Frere, the Governor of Bombay, having taken into consideration the position of the Company, and the efforts made by it to develop river navigation in India, recommended the payment to this Company of a yearly subsidy of 1,000 £. for each vessel kept regularly running on the Indus; and that this recommendation was not confirmed by the Indian Government.

12. That the Oriental Inland Steam Company having been compelled by this unequal competition to offer terms of purchase to the Indus Steam Flotilla, it is manifestly inequitable that the terms arranged should be other than those which will accord with a liberal interpretation of the facts here set down.

13. That the terms of purchase to which the Secretary of State for India in Council has given his consent, press so hardly upon the shareholders of the Oriental Inland Steam Company, as to give the appearance of actual injustice on the part of the Government of India, in first being instrumental in driving the Company from the river, and their taking advantage of its helplessness to purchase its property at a nominal price.

As this cannot be the intention of the Government of India, it is respectfully submitted that the exertions and sacrifices made by the Oriental Inland Steam Company reasonably entitle it to receive liberal consideration from the Government of India in connection with the transfer of its property to the Indus Steam Flotilla.

6, Billiter-street, 25 April 1867.

I am, &c.
(signed) Robert Wilson,
Secretary.

Enclosure 12, in No. 1.

Oriental Inland Steam Company (Limited),
6, Billiter-street, 3 May 1867.

Right Honourable Sir,

REFERRING to the observations you were pleased to make to the deputation from this Company, which had the honour of waiting upon you on the 30th ultimo, I am now instructed by the Directors in the first place to thank you, Right honourable Sir, for the extension of time granted for the completion of the negotiations with the Indus Steam Flotilla; and, further, to ask your favourable consideration of the claims of this Company, and specially of the request now preferred, viz., either

1. That the terms proposed to the Indus Steam Flotilla in my letter of 15th March last, as per "Statement" already submitted, may be sanctioned by the Council of India; or,
 2. That in any case a minimum as well as a maximum sum may be named; or,
 3. That a definite sum may be offered; and I am instructed to urge this request on the following grounds:—
1. Because the terms proposed by the Indus Steam Flotilla are partial and arbitrary in their character, inasmuch as they empower the Government of Bombay, acting irrespective of this Company, to assess the value of its property, with this restriction, that the assessed value, whatever the intrinsic and relative value may be, shall not exceed 75,000 *l.* in Indus Flotilla Stock at par.
 2. Because by these terms the Company cannot receive more than 75,000 *l.*, and will be compelled to take any less amount, however inadequate, which the Bombay Government may determine.
 3. Because the property to be transferred having cost near 150,000 *l.*, as per Appendix No. 2, in "Statement," it is inequitable to fix the maximum price to be paid for it at only half its cost.
 4. Because these terms would be arbitrary and inequitable had the two companies been working on an equal footing; and because they appear especially so when the facts enumerated in the "Memorandum," a printed copy of which is now enclosed, are taken into consideration.
- For these reasons, and for the further consideration that the property of this Company on the river Indus would, in the opinion of the directors, be worth 100,000 *l.* to a rival Company, while to a Company like the Indus Steam Flotilla, remaining alone and unopposed on the river, it would be worth not less than 150,000 *l.*, the Directors respectfully request that the application now made may be granted.

The Right hon.
Sir Stafford Northcote, Bart., M.P.,
Secretary of State for India in Council.

I have, &c.
(signed) Robert Wilson,
Secretary.

Enclosure 13, in No. 1.

Sir,

India Office, 16 May 1867.

I AM directed by Sir Stafford Northcote to acknowledge and to reply to your letter of 3rd instant, requesting reconsideration of the terms proposed, with the concurrence of the Secretary of State for India, by the Indus Flotilla Company, for the purchase of the vessels and other property of the Oriental Inland Steam Company.

As the proposal at present stands the price is to be such a sum, not exceeding 75,000 *l.*, as the Bombay Government may approve. In consequence, however, of the representations on the subject made to him by the Directors of the Oriental Inland Steam Company, Sir Stafford Northcote is willing that this condition should be somewhat modified. He will be prepared to sanction the purchase for the sum of 75,000 *l.*, should the Bombay Government consider the property in question to be worth so much to the Indus Flotilla Company.

He has made an intimation to this effect to the directors of the Indus Flotilla Company, with whom he would suggest that your Board should again communicate on the subject.

Robert Wilson, Esq.,
Secretary, Oriental Inland Steam Company.

I am, &c.
(signed) James Fergusson.

Enclosure 14, in No. 1.

Sir,

India Office, 16 May 1868.

WITH reference to the concluding paragraph of my letter of 28th February, relative to the proposed purchase by the Indus Flotilla Company of the vessels and other property of the Oriental Inland Steam Navigation Company, I am directed by Sir Stafford Northcote to acquaint you, that he has informed the Directors of the latter Company, in reply to representations from them on the subject, that he is willing that the conditions of purchase specified in the paragraph in question should be somewhat modified. He will, if the Indus Flotilla Company desire it, be prepared to sanction the purchase for the sum of 75,000 £., in fully paid-up shares of that Company at par, provided also that the Bombay Government consider the property to be worth so much to that Company.

W. P. Andrew, Esq.

I am, &c.
(signed) *James Fergusson.*

— No. 2. —

(Railway Department.)

LETTER from the Secretary, Public Works Department, India Office, to the Secretary to the Government of Bombay, Public Works Department (Railway).

Sir,

India Office, London, 27 May 1867.

WITH reference to Sir Stafford Northcote's Railway Despatch, No. 14, of the 18th instant, I beg to transmit herewith copy of further correspondence on the subject of the proposed purchase by the Indus Flotilla Company of the property on the Indus of the Oriental Inland Steam Company.

I have, &c.
(signed) *W. T. Thornton,*
Secretary, Public Works Department.

Enclosure 1, in No. 2.

(No. 2549.)

Indus Steam Flotilla Office,
Gresham House, Old Broad-street, London,
17 May 1867.

Sir,

I HAVE the honour to acknowledge the receipt of Sir James Fergusson's letter of the 16th instant, in continuation of previous correspondence in regard to the negotiations pending between the Oriental Inland Steam Company and the Indus Steam Flotilla, stating that Sir Stafford Northcote is willing that the conditions of purchase specified in the concluding paragraph of the letter noted in the margin* should be so far modified that, if the Indus Flotilla Company desire it, he would be prepared to sanction the purchase for the sum of 75,000 £. in fully paid-up shares of the Indus Steam Flotilla at par, provided also that the Bombay Government consider the property to be worth so much to this Company.

In reply, I am to state that the Directors are prepared to agree to the purchase of the Oriental Inland Steam Company's property upon these terms; and I have now to enclose a letter which the Board propose addressing to their Agent and Superintendent in India upon the subject, in order that the views of the Local Government may be ascertained.

This letter I have to request you will do me the favour to submit for the approval of the Secretary of State for India in Council.

The Under Secretary of State for India.
&c. &c. &c.

I am, &c.
(signed) *W. P. Andrew,*
Chairman.

No. 2550 of 17th
May 1867.

* Letter from Sir James Fergusson to W. P. Andrew, Esq., dated 28th February last.

Enclosure 2, in No. 2.

(No. 4 of 1867.)

(No. 2550.)

Indus Steam Flotilla Office,
Gresham House, Old Broad-street, London,
17 May 1867.

Sir,

I HAVE to inform you that a negotiation has for some time past been in progress between this Company and the Oriental Inland Steam Company, with the object of arranging the terms of a proposed transfer of the vessels and property of the latter Company upon the Indus to the Indus Steam Flotilla.

2. The Secretary of State for India having been communicated with on the subject, Sir Stafford Northcote has signified his assent to a proposition that the vessels and property in question should be purchased by this Company for the sum of seventy-five thousand pounds (75,000 £.), (the payment being made in Indus Steam Flotilla stock at par), provided the Bombay Government are of opinion that the property is worth that amount to the Indus Steam Flotilla.

3. I have now to request, therefore, that you will address the Local Government in order to ascertain their opinion of the proposal which has been thus provisionally sanctioned; and it is important that this should be done with as little delay as possible, as there is reason to believe that the Oriental Inland Steam Company have not for some time past been in a position to incur the expenditure which is, from time to time, required to keep vessels in a state of thorough repair.

4. In anticipation of your reply to this letter, I have to request that you will telegraph to me the result of your reference to the Local Government, in order that the Boards of this Company and the Oriental Inland Steam Company may be enabled, as soon as possible, to issue the necessary instructions to their Agents, in the event of the proposal now communicated to you being adopted.

5. I should state that the words "vessels and property," which occur in the first paragraph of this letter, are intended to include all vessels, stores, landed and other property of every description, belonging to the Oriental Inland Steam Company, upon the Indus and at Kurrachee, together with the entire goodwill of the connection of that Company on the river.

Captain John Wood,
Agent and Superintendent, Kotree.

I am, &c.
(signed) W. P. Andrew, Chairman.

Enclosure 3, in No. 2.

Sir,

India Office, 23 May 1867.

I AM directed by the Secretary of State for India to acknowledge receipt of your letter of the 17th instant, No. 2549, agreeing on behalf of the Sind Railway Directors, to the modified terms specified in my letter of the 16th instant, for the purchase by the Indus Flotilla, of the vessels and other property on the Indus of the Oriental Inland Steam Navigation Company.

The proposed letter to the Agent on the subject (No. 2550) which accompanied your letter may be forwarded.

W. P. Andrew, Esq.

I am, &c.
(signed) James Fergusson.

Enclosure 4, in No. 2.

Oriental Inland Steam Company (Limited),
6, Billiter-street, London, 23 May 1867.

Sir,

THE Directors instruct me to acknowledge the receipt of your letter of the 16th instant, informing them that the Right Hon. the Secretary of State for India had been pleased, on consideration of the representations they had made to him, to modify the terms proposed for the purchase of the property of this Company by the Indus Steam Flotilla.

The terms, as modified, are that the Secretary of State for India will be prepared to sanction the purchase for the sum of 75,000 £., should the Bombay Government consider the property in question to be worth so much to the Indus Flotilla Company.

I am

I am respectfully to state in reply, that the Directors accept the offer, as modified, feeling satisfied that the Government of Bombay will, upon a review of all the circumstances of the case, approve of the purchase on these terms, and that a communication has been made with the Directors of the Indus Steam Flotilla to this effect.

Sir James Fergusson, Bart., M.P.,
Under Secretary of State for India,
India Office.

I have &c.
(signed) *Robert Wilson*,
Secretary.

Enclosure 5, in No. 2.

Sir,

India Office, 27 May 1867.

I AM directed to acknowledge receipt of your letter of 23rd instant, intimating acceptance by the Oriental Inland Steam Navigation Company of the modified terms which have been sanctioned by the Secretary of State for India for the purchase of their property by the Indus Steam Flotilla Company.

With reference to the second para. of this letter, I am directed by Sir Stafford Northcote to observe, that in the event of the purchase being completed, payment is to be made, as originally proposed, in paid-up shares of the Indus Steam Flotilla Company at par.

R. Wilson, Esq.

I am, &c.
(signed) *J. Cosmo Melvill*.

— No. 3. —

(Railway Department, No. 27 of 1867.)

RAILWAY DESPATCH from the Governor in Council at Bombay to Her Majesty's Secretary of State for India, London.

Right Honourable Sir,

Bombay Castle, 24 August 1867.

WE beg to acknowledge the receipt of your Despatch, No. 14, dated 18th May 1867, and its accompaniments, regarding the transfer of the property of the Oriental Inland Steam Navigation Company to the Indus Steam Flotilla Company.

2. From the copies of further papers* herewith annexed, you will see, however, that the Oriental Inland Steam Navigation Company has fallen into difficulties, and that it has become necessary for us to take steps not only to afford reasonable assistance to the Company to enable it to carry through the arrangement which have been approved by you, but also to protect the interests of Government itself, which is a creditor of the Oriental Inland Steam Navigation Company to the extent of about 1½ lakh of rupees.

* Agent's letter, No. 656 G., of 18 July 1867.
Commissioner in Sind's, No. 723 of 19 July 1867.
Government letter, No. 1614, of 3 August 1867.

3. We considered that if the Agent of the Company had the power, and was willing to mortgage to Government the whole of the Company's property for a sum of two lakhs, or thereabouts, Government could satisfy the other creditors of the Company, and recover its own debt, without incurring any risk, and the arrangements intended by the two Companies, with your consent, could ultimately be carried out.

4. We therefore addressed the Commissioner in Sind in this view, and directed him to take proceedings accordingly; and we desired him, failing the practicability of effecting the mortgage above referred to, to take legal steps to attach a portion of the Company's property in satisfaction of the debt due to Government.

5. We feared that if this was not done the other creditors would obtain judgment, and that the result of a forced sale of the Company's property would be that there would be no assets left to meet the claims of Government.

6. We have been informed, in reply to our letter of instructions to the Commissioner in Sind, that the Government law officer at Kurrachee is of opinion that

that the Agent has not the power to effect a mortgage of the Company's property without the consent of the Directors, and that the arrangement we proposed is not consequently practicable.

7. From the 2nd paragraph of Mr. Havelock's letter, No. 827, dated 7th instant, it also appears that there is a rumour that the Company's property is encumbered in England.

8. Under these circumstances, the Commissioner has taken steps to institute legal proceedings, and attachment of property, in satisfaction of the debt to Government; it being of course open to us to proceed in such a way as will be least inconvenient to the Company, consistent with the recovery of the amount due by them to Government.

9. The Agents of the Company, and of the Indus Flotilla Company, have respectively addressed their Directors, by telegram, for instructions how to act in this emergency; and as no doubt the Directors will lay the affair before you, we await your further orders.

10. In the meantime we shall proceed with all the regard practicable for the interests of the Oriental Inland Steam Navigation Company.

We have &c.
(signed) *W. R. S. V. Fitzgerald.*
 R. Napier.
 B. H. Ellis.
 S. Mansfield.

Enclosure 1, in No. 3.

(No. 656 G, of 1867.)

From the Agent and Superintendent, Oriental Inland Steam Company (Limited),
to the Commissioner in Sind.

Sir,

Kurrachee, 18 July 1867.

I HAVE the honour to bring to your notice the following statement of the affairs of this Company, in the hope that you may be able, under the circumstances, to sanction such measures as may tend to alleviate the unfortunate crisis at which matters have arrived:—

1. By an arrangement between the Directors of this Company and those of the Indus Steam Flotilla Company, and with the approval of Her Majesty's Secretary of State for India, a sum of 75,000 *l.* was agreed upon as the price of this Company's property on the Indus, should the Bombay Government consider the property worth so much.

2. This arrangement was entered into at the end of May last, and a telegram was immediately sent to me to stop the steamers, which were then all working at a loss, and discharge the crews, &c.

3. This has been done, but from the absence of funds here, and from the inability of the Directors to obtain any advance by loan or otherwise, the crews of steamers, and the Company's servants generally, have been, and are still, since that date, creditors of the Company for their wages.

4. To continue the steamers running was impossible, as each trip was a heavy loss, and to repeated telegrams and application by letters for relief, the Directors have been unable to respond.

5. The liabilities for wages and debts here amount to, in round figures, 20,000 *l.*, without including the purchase-money, still unsettled with Her Majesty's Government, for the steamer "Oobarah." This amount may be classed as follows:—

6. Wages, including notices and passages home, &c., about 7,000 *l.*; debts due Government, debts due others, about 13,000 *l.*; total, 20,000 *l.*

7. In the meantime, the Sind Railway, in pursuance of a judgment obtained by them, 38,000 rupees, have obtained attachments of the office Agent's house, and whatever balance there might be at the bankers.

8. That as Mr. Andrew, who is in treaty for the purchase of the property referred to, in his capacity of Director of the Indus Steam Flotilla Company, might deduct from the purchase-money such amount as may be due him as Director of the Sind Railway Company, the above attachment of property is unnecessary and uncalled for.

9. That the fact of the property of the Company being attached will have an immediate effect upon the other creditors of the Company; and that I believe nothing but the fact
of

of the Small Cause Court being closed for vacation prevents a number of suits being filed against the Company at once.

10. That the effect of this will be to entirely vitiate the arrangement for transfer in negotiation, as portions of the property would be sold to meet these demands for wages, &c.; and also, that if sold in this way by piecemeal, the property would realise nothing like its real value, and a ruinous loss would ensue.

11. Submitting the above for your consideration, I would beg most respectfully to suggest that the interference of Her Majesty's Government in this matter might be of the greatest possible benefit to all parties concerned.

12. I would beg your interference to ensure protection for the property against attachment; and I would also beg you to sanction such portion of the purchase-money as may be necessary to clear off all debts and demands here, be retained here by the Local Government for that purpose, and so applied; and in order to expedite the time when this may be made available, that the committee of inquiry on the value of the property just appointed be instructed to complete their decision as speedily as possible, as the case of those servants of the Company now waiting for two months, and more in some cases, for their wages, is hard indeed.

13. Immediately on the receipt of your sanction to such an application of the purchase-money as I have stated above, I shall telegraph for the approval of the Directors of this Company.

I have, &c.
(signed) *Franklin Fox*,
Agent and Superintendent,
Oriental Inland Steam Company (Limited).

Enclosure 3, in No. 3.

(Marine Department—No. 723 of 1867.)

From the Commissioner in Sind to the Agent and Superintendent, Oriental Inland Steam Company (Limited), Kurrachee.

Commissioner's Office, Kurrachee,
19 July 1867.

Sir,
I HAVE the honour to acknowledge receipt of your letter, No. 656, dated 18th instant.

2. With regard to the request contained in the 11th paragraph, I beg to inform you that protection against attachment is a matter for the consideration of the law tribunals, and that on reference to the correspondence received from Government on the subject of the contingent purchase by the Indus Flotilla Company of the vessels and other property of the Oriental Inland Steam Navigation Company, the mode of payment of the purchase-money precludes any present likelihood of any portion being paid in the manner desired by you.

3. Your letter has, however, been submitted to Government.

I have, &c.
(signed) *W. H. Havelock*,
Acting Commissioner in Sind.

Enclosure 3, in No. 3.

(Railway Department—No. 1614 of 1867.)

Sir,
I HAVE the honour to acknowledge the receipt of your No. 724, dated 19th July 1867, and its accompaniments, on the subject of the difficulties of the Oriental Inland Steam Navigation Company.

2. I have this day, by the direction of his Excellency the Governor in Council, forwarded you a telegram (copy annexed) instructing you how to act in the matter.

3. You correctly informed the Agent of the Company that the prescribed mode of payment of the purchase-money preclude any portion of it being paid in the manner suggested by him.

4. But the difficulties into which the Company has fallen, render it advisable that Government should extend some assistance, if it can do so without risk; not only in view to rendering it practicable to carry out the arrangement between the two Companies which has been approved by the Secretary of State, but also to protect Government

itself from the loss of the money due by the Company on account of the "Ooborah," &c., which might follow the attachment of the Company's property, and its forced sale; for there is no person in Sind likely to purchase any of it except the houses; and, therefore, if the whole property is attached by the various creditors, it will probably fetch little more than is required to clear off the Company's liabilities to its creditors other than Government.

5. In this view the following arrangement may be carried out, if the Agent has powers that will enable him to act in the matter. A mortgage of the whole property of the Company to Government should be effected, and on this being done, the creditors may be guaranteed their debt, or receive payment if they will not accept the guarantee. It is advisable, however, that if possible they should be induced to accept a guarantee.

6. It is understood that the whole of the Company's liabilities, exclusive of its debt to Government, do not exceed two lakhs of rupees, or thereabouts.

7. It will be necessary to ascertain that the property is not already encumbered by any prior deed or judgment; and if money has to be paid by Government, it must also be seen that it is applied to the discharge of existing debts and judgments.

8. If the above arrangement cannot be carried out, you should take the necessary steps to attach, through the Court, so much of the Company's property as will cover the debt due to Government.

I have, &c.
(signed) *M. K. Kennedy*, Colonel, R.E.,
Secretary to Government.

To the Commissioner in Sind, Kurrachee.

Enclosure 4, in No. 3.

(Marine Department, No. 827 of 1867.)

From *W. H. Havelock*, Esq., Acting Commissioner in Sind, to Col. *M. K. Kennedy*, R.E.,
Secretary to Government, Public Works Department.

Commissioner's Office, Kurrachee,
7 August 1867.

Sir,

I HAVE the honour, in continuation of the subject of my telegram, dated 2nd instant, of which copy is appended, to report for the information of the Right honourable the Governor in Council, that as a preliminary to carrying out the arrangements in regard to the property of the Oriental Inland Steam Navigation Company, the Government pleader, Mr. Rochfort, has been consulted, and is clearly of opinion that the Agent, Mr. Fox, has no authority under the power of attorney held by him from his Directors to mortgage the Company's property without their consent previously obtained. Copy of the said power is appended.

2. There are rumours that besides the liabilities in this Province there is a lien on the property at home. The Agent, Mr. Fox, verbally states ignorance of any such lien. A reference to the directors at home might clear up this point. The Agent here does not appear to have definite instructions from his authorities in England, or to be able to obtain such.

3. I see no other course under the apparent supineness or want of information of the authorities of the Company in England than to proceed to immediate legal action for recovery of Government claims. It is quite competent to the Company during the legal proceedings to make such a communication to Government as should warrant considerate forbearance and even assistance, which has been already proffered under fair conditions; I would press the point that the mortgage should be for the entire property.

4. Under the instructions conveyed in your telegram, I have taken steps to initiate legal proceedings and attachment.

5. At the same time I believe that Government would be very anxious to obviate any unnecessary harshness towards a company which has been started for an important public purpose, and I further believe that the continuance and assistance of Government will be indispensable towards obtaining for the Company a fair value for their locally valuable property. There is no one to purchase but the Indus Flotilla Company; and the Oriental Company have an obvious and emergent interest in realising the benefits of the arrangement sanctioned by Her Majesty's Secretary of State, as communicated in Government Resolution, No. 1415, dated 6th July 1867. For these reasons, I am in hopes that the Company may stir themselves to meet the difficulty, and take steps to avert the immediate pressure and scandal, and to avail themselves of the considerate intervention of Government, intervention which is probably of the greatest value between the one flourishing Company, willing only to buy cheap, and the other sinking Company, which can only hope to obtain a moderate valuation on its assets.

I have, &c.
(signed) *W. H. Havelock*,
Acting Commissioner in Sind.

— No. 4. —

(Railway Department, No. 30 of 1867.)

RAILWAY DESPATCH from the Governor in Council at Bombay to Her Majesty's Secretary of State for India, London.

Right honourable Sir, Bombay Castle, 28 September 1867.

WITH reference to our Despatch, No. 27, dated 24th ultimo, we beg to send you herewith the accompanying papers in continuation.

From these you will observe that it is not considered advisable by the officers in Sind that the Indus Flotilla Company should take over the plant of the Oriental Inland Steam Navigation Company.

We have, &c.
(signed) *W. R. S. V. Fitzgerald.*
B. H. Ellis.
S. Mansfield.

Enclosure 1, in No. 4.

(No. 27 K, of 1867).

Indus Steam Flotilla Agent and Superintendent's Office,
Kurrachee, 1 August, 1867.

Sir,

I HEREWITH annex copy of a telegram just to hand from the Board, forbidding the advance of cash to the Oriental Inland Steam Navigation Company.

2. I have no desire to decry the steamers of the Company, but I may be permitted to observe, they are not the kind of vessels we would build for ourselves. All of them, save the "Jehlum," draw, with their fuel on board, over four feet of water.

3. In absence of graving or floating dock, and without the engineers being thoroughly examined, it is impossible to get at the actual state of the hulls, machinery, and boilers of the vessels. Some may require a new bottom, perhaps a new hull, while the "Jehlum" is currently reported to have broken her back.

4. A large portion of the Flotilla capital having been laid out upon steamers which do not pay their expenses, is unremunerative. Some new steamers have lately been added to our fleet, from which better things are expected, and when these are all at work, we shall have, unless the traffic increases, as much steam tonnage as is likely to be remunerative.

5. An inspection of the Company's financial position will show, that it is the interest of both the Government and the Company, that no addition should be made to the capital of the Company that cannot be shown to be reasonably and speedily remunerative.

6. I may add, that since writing my letter of the 13th June, No. 1, to you, on this subject, I have ascertained that all the barges of the Oriental Inland Steam Navigation Company are in very bad condition, and that there is not one among them which, without a large outlay, could be used for carrying troops.

7. I have obtained permission from Captain Fox to examine the vessels and property; and when this is done, I shall be able to say what, in the present condition of trade and our prospective requirements, the steamers of the Oriental Inland Steam Navigation Company are worth to this Company.

8. The returns of both companies demonstrate that for the past 12 months there has not been enough of traffic upon the river to keep all the steamers profitably employed. Were the vessels of the Oriental Inland Company now at my disposal, I do not see what immediate use could be made of them.

9. Now that the "Sir Charles Wood" and the "Stanley" have been put out of commission, the only old boats remaining unsuited to our work are the tugs "C." and "D." These are handy little vessels of their kind, and were they for sale, one or both would probably be bought for the Punjaub Flotilla, as they are well adapted to the navigation of the Upper Indus. Would it not, therefore, be better for the interest of this Company to build two new steamers for the Flotilla, such as we require, rather than buy a lot of worn-out vessels that are sure to cost we know not how much to put them to rights?

10. It having been decided that a large proportion of the annual reliefs are hereafter to travel by the Indus, the two steamers I have suggested to be built in lieu of the four to be put out of commission should, as well as their barges, be designed primarily with special reference to the accommodation and conveyance of troops. We have at present no such steamers, and I would respectfully suggest that the depreciation fund could not be better invested than in providing them.

I have, &c.
(signed) *J. Wood,*
Agent and Superintendent, Indus Steam Flotilla.

To Major Bonus, R.E.,
Deputy Consulting Engineer for Railways
in Sind, Kurrachee.

Enclosure 2, in No. 4.

(No. 1252 of 1867).

Indus Steam Flotilla Agent and Superintendent's Office,
Kotree, 15 August 1867.

Sir,
THE committee's report of the vessels of the Oriental Inland Steam Company is herewith enclosed.

2. As much of the information was furnished to the committee by the Chief Engineer of the Oriental Inland Steam Company, the vessels are not likely to turn out better than they are described in their report.

	Rs.
3. The repairs are estimated at - - - - - - - -	88,000
To this I would add 50 per cent. - - - - - - - -	44,000
Sum required to put the boats into good repairs - - - -	<u>1,32,000</u>

4. We are unable in the present state of trade to procure sufficient cargo for the vessels we have; and during the last half-year the expenditure of the Flotilla exceeds its earnings. These are facts which should be weighed before any further addition is made to the capital of the Company. Our best security against competition is to possess the most economical steamers, and those best suited to the traffic of the river.

I have, &c.
(signed) *J. Wood,*
Agent and Superintendent, Indus Steam Flotilla Company.

To Major Bonus, R.E.,
Deputy Consulting Engineer for Railways
in Sind, Kurrachee.

Enclosure 3, in No. 4.

(No. 1256 of 1867.)

Indus Steam Flotilla Agent and Superintendent's Office,
Kotree, 16 August 1867.

Sir,
IN answer to the Government request conveyed through your No. 1100, of 16th ultimo, I would refer you to No. 27 K, and 1252, of 1st and 15th instant, from this office, as embodying my views on the impolicy of saddling the Flotilla with the worn-out stock of the Oriental Inland Steam Navigation Company.

2. The value of the property, whatever that may be, is not the first consideration for this company. At present there is not enough traffic to keep the boats we have at work profitably employed; and before this year has closed, our fleet will be increased by three more steamers, those now in course of re-erection at Keamaree. What, under these circumstances, could we do with the vessels of the Oriental Inland Steam Navigation Company, if we had them?

I have, &c.
(signed) *J. Wood,*
Agent and Superintendent, Indus Steam Flotilla Company.

To Major Bonus, R.E.,
Deputy Consulting Engineer for Railways
in Sind, Kurrachee.

Enclosure 4, in No. 4.

(No. 1301 of 1867.)

From the Deputy Consulting Engineer for Railways in Sind to the Commissioner in Sind, Kurrachee.

Office of Deputy Consulting Engineer for Railways in Sind,
Kurrachee, 20 August 1867.

Sir,
WITH reference to your No. 703, of the 16th July last, Agent and Superintendent, No. 27 K., of 1st August. I have the honour to forward herewith copies of the papers " " " No. 1252, of 15th August, marginally noted. " " " with committee's report. No. 1256, of 16th August.

2. I have given this question of the proposed transfer of the Oriental Inland Steam Company's property to the Flotilla Company, on payment of 75,000*l.* in Flotilla Stock at par, the most careful consideration, and I have discussed the matter very thoroughly with Captain Wood. The result is that I am unable to recommend the completion of the purchase.

I have, &c.
(signed) *J. Bonus*, Major R.E.,
Deputy Consulting Engineer for Railways in Sind.

Enclosure 5, in No. 4.

(Marine Department.—No. 913 of 1867.)

From the Commissioner in Sind to Lieutenant Colonel Kennedy, Secretary to Government Railway Department, Bombay.

Commissioner's Office, Kurrachee,
22 August 1867.

Sir,
I HAVE the honour, with reference to G. R. (Railway Department) No. 1415, dated 6th ultimo, to forward a letter, No. 1301, dated 20th instant, from Major Bonus, Deputy Consulting Engineer for Railways, with accompaniments.

2. It appears that the plan for the transfer of the vessels and other property of the Oriental Inland Steam Navigation Company to the Indus Flotilla Company, on the terms proposed, cannot be recommended by Major Bonus; and it further appears that the Agent and superintendent of the Indus Flotilla is averse, under present circumstances, from taking any of the vessels.

3. Adverting to my letter No. 827, dated 7th instant, and to the communication forwarded with my Memorandum, No. 900, dated 20th instant, I beg to point out that Government are interested in the liquidation of the Oriental Company in more ways than one; and I would still recommend such support as *bonâ fide* guarantees from the liquidators in England may render safe and prudent. It is obvious that, in the helpless position of the Company's affairs, it is Government assistance alone that will enable them to obtain even an approximate value for their property.

4. Possibly the Punjab Government might find it worth while to purchase some of the property for their flotilla, and one or more of the vessels might be available for river service of Government on the Euphrates.

I have, &c.
(signed) *H. Havelock*,
Acting Commissioner in Sind.

Enclosure 6, in No. 4.

REPORT on the Steamers and Barges of the Oriental Inland Steam Navigation Company.

STEAMERS.	STATE AND CONDITION.										Dimensions.			REMARKS.		
	Draft of Water, with OneDay's Wood.	Consumption per Hour of Wood.	Number of Berths for Passengers in addition to those for Crew.	Diameter of Cylinder.	Length of Stroke.	Nominal Horse Power of Engines.	Working Pressure in Boiler.	HULL.			MACHINERY.					
								Bottom.	Decks.	Wheels and Sponsons.	Engines.	Boilers.	Length.		Beam.	Depth.
Indus	3 9	64	4 double, and 1 single cabin.	40½	5 0	120	25	Good	Fore part good; after part requires renewing.	Out of order.	-	-	218	20 0	7 3	- - - This vessel has been running for five years and nine months. Her hull is in good condition. The repairs required are as follows: New paddle-boxes, new docks from the centre of the vessel to right aft, and after hold requires to be fitted with flooring boards, but cabin could easily be put in this space if required; and wood roofing aft requires to be refitted. Engines, a pair of diagonal cylinders, in general good condition, one crank having been broken, but effectively repaired, with a cast-iron stiffener outside; sundry slight repairs only required. Boilers, two in number, vertical tubular, requiring general good repairs to bottoms, tubes, stays, and ash pans. Paddle wheels, common floats, originally feathering, now requiring altering back to their original form, with good repairs. The whole of the above repairs can be effected without docking the vessel or taking the boilers out, for about 7,000 rupees,
Soane	4 0	65	2 double cabins.	40	4 0	120	25	Nearly worn out.	Good; only requires caulking.	Out of order.	In bad condition.	In bad condition.	200	17 6	7 6	- - - This vessel was built, and did service on the Clyde; was afterwards taken to pieces, sent out to Calcutta, where she was re-erected, and ran on the Ganges for some years. In 1864 she was brought under steam to the Indus, on which river she has been running ever since. Her bottom, in midship, is tolerably good, but the fore and after part, with flooring plates, are worn thin, and very much corroded. Engines diagonal, oscillating, require heavy repairs; in general, heavy parts of machinery good; all the brasses, pipes, and working parts require repairs, being much worn. Boilers, two in number, vertical tubular, requiring heavy repairs; up-takes bad, and other parts very thin. Ash pans, funnels, and casings require to be renewed, with sundry repairs to stays. Paddle wheels, common floats, originally feathering, now requiring altering to their original form, with general good repairs: the repairs to engines and boilers could be effected without docking. To renew the bottom she would require docking, but we consider she could run for some time with her present bottom, when other repairs are effected. The cost would be about £10,000.

-- This vessel was built on the Clyde, and did service on that river; was afterwards taken to pieces and sent out to Calcutta, where she was erected, and ran on the Ganges for some time. In 1864 she was brought down to the Indus, on which river she has been running ever since. Her bottom plates and flooring throughout are very much worn and corroded; paddle-boxes require to be renewed; decks, teak, require caulking and flooring; boards throughout require renewing, and wood roofing requires to be repaired.

Engines vertically oscillating, requiring heavy repairs; heavy parts of machinery good, and brasses, pipes, and working parts defective. Boilers, two in number, vertical; tubular water spaces very thin, and other parts requiring repairs. New ash-pans, fire, and bearing bars required. Paddle-wheels, feathering floats requiring general overhaul with heavy repairs. The repairs to engines and boilers would be effected without docking. We consider this vessel requires a new bottom, in which case she would have to be docked. The cost of the above repairs would be about 12,000 rupees, and for a new bottom in addition 20,000 rupees.

-- This vessel has been running for three years and eight months. Hull good in general, but shows indications of weakness amidships just before the engine-room. Flooring boards in cargo rooms all worn out, and require renewing.

Engines diagonal, cylinders requiring general overhaul, with nearly all new brasses, with sundry other repairs; heavy parts of machinery good and sound. Boilers, two in number, tubular, requiring slight repairs only to stays and bottoms. Paddle-wheels, feathering floats, heavy repairs required. All the above repairs could be effected without docking, and for the sum of about 7,000 rupees.

-- This vessel has been running four years and seven months and built of slight materials, and stands in need of the following repairs:—A new bow, repairs to several of the angle iron stays fore and aft, and the bottom part of the after bulkhead in the fore cargo room. A new deck over both boilers, and the after cargo room; also new flooring boards fore and aft.

Engines horizontal; cylinders requiring overhauling and slight repairs effected. Paddle-wheels and common floats requiring good repairs, and now much bent and out of order. The whole of the above repairs could be effected without docking at a cost of about 6,000 rupees.

Goyra	-	-	-	3	10	55	2 double cabins.	40	3	6	120	25	Very much worn out.	Good; only requires caulking.	Out of order.	-	-	-	210	18	0	7	6
Jehlum	-	-	-	3	4	70	2 double-berthed cabins.	46	5	0	150	25	Good	Iron, and in good condition.	Out of order.	Out of order.	In fair condition.	245	24	0	8	3	
Onbarah	-	-	-	2	3	80	6 cabins; 6 sleeping berths in saloons.	39	6	0	120	20	Good, but thin.	Main deck good; but upper deck requiring repairs.	Out of order.	In fair condition.	In fair condition.	240	38	0	5	0	

Report on the Steamers and Barges of the Oriental Inland Steam Navigation Company—continued.

STEAMERS.	Draft of Water, with One Day's Wood.	Consumption per Hour of Wood.	Number of Berths for Passengers in addition to those for Crew.	Diameter of Cylinder	Length of Stroke.	Nominal Horse Power of Engines.	Working Pressure in Boiler.	STATE AND CONDITION.				Dimensions.			REMARKS.	
								HULL.		MACHINERY.		Length.	Beam.	Depth.		
								Bottom.	Decks.	Wheels and Spontons.	Engines.					Boilers.
BARGES :		Mds.			Feet.		Lbs.				Feet.	Feet.	Ft. in.			
Moolan	-	-	None	-	-	-	-	Worn thin	Good ; requiring slight repairs.	-	-	-	154	18 0	4 6	{ - - These are barges converted from the original train (Bourne's), and have been running since 1861. They are built on the open bow principle. Their bottoms are much worn, but require no immediate repairs. Decks, iron, strained by heavy materials on them, and require slight repairs. Flooring boards required fore and aft. Gunwales towing-sides worn out and broken, to be renewed. Stanchions and hand-rails required repairing. The whole of the above repairs could be effected without docking at a cost of 2,000 rupees each.
Khetty	-	-	None	-	-	-	-	"	"	-	-	-	154	18 0	4 6	
Kurrachee	-	-	None	-	-	-	-	"	"	-	-	-	158	18 0	4 6	
Sakur	-	-	None	-	-	-	-	"	"	-	-	-	144	18 0	4 6	
Munora	-	-	None	-	-	-	-	Worn out	Iron, in fair condition.	Iron, in fair condition.	-	-	142	18	4 6	{ - - This barge has been converted from the original train (Bourne's), and has been running since 1859. She is built on the open bow principle. The plates in the bow are much indented and cracked, and several angle irons broken. This damage has been temporarily repaired. Her bottom is worn very thin and much corroded, and her woodwork completely destroyed.
Shewan	-	-	None	-	-	-	-	Worn out	Worn out	-	-	-	138	18	4 6	{ - - This was the passenger barge of original train (Bourne's); commenced running in 1858. She has a wooden deck, which is completely perished and worn out; her bottom being very thin and much corroded. The above-mentioned barges we consider unfit to run, and not worth repairing.
Hyderabad	-	-	None	-	-	-	-	Good	Out of order	-	-	-	171	18	4 6	{ - - This barge was converted from the original train (Bourne's); commenced running 1863. She is built with sharp bow and run. Her bottom is in fair condition. Decks, iron, much strained. Few beams and iron combings broken, and all the woodwork on deck is in a damaged state. Flooring boards broken; require to be renewed. The above repairs could be effected afloat for about 2,000 rupees.
Kotree	-	-	None	-	-	-	-	Good	Good	-	-	-	168	24	6 0	{ - - This barge commenced running in April 1867. She is built with sharp bow and run. Plates $\frac{1}{2}$ of an inch thick, and floorings placed very close. This vessel is in every respect in good working order.

No. 5.

(Railway Department.—No. 34 of 1867.)

RAILWAY DESPATCH from the Governor in Council at Bombay to Her Majesty's Secretary of State for India, London.

From the Commissioner in Sind,
Nos. 1007 and 1092, dated respectively the 7th and 24th September 1867, with accompaniment.

Right honourable Sir,

IN continuation of our Despatch, No. 30, dated 28th September last, we have the honour to forward further papers relating to the Oriental Inland Steam Navigation Company.

2. It seems that the property of this Company, in addition to debts in this country aggregating about 28,000 *l.*, has liabilities in England secured on it to the extent of above 600,000 *l.* more.

3. Such being the case, and further taking into consideration that the Company's vessels are stated, both by the Agent of the Company, and Major Bonus, the Deputy Consulting Engineer for Railways to Government, to be unsuitable for the purposes of the Indus Flotilla Company, it does not seem to us advisable to stir further in the matter, except to take the legal steps that are necessary to secure payment of the debt to Government.

4. The Commissioner in Sind, you will observe, now advocates this manner of proceeding, and we have informed him that we have approved of his views.

We have, &c.

(signed) *W. R. S. V. Fitzgerald.**B. H. Ellis.**S. Mansfield.*

Bombay Castle, 31 October 1867.

Enclosure 1, in No. 5.

(Marine Department.—No. 1007 of 1867.)

From the Commissioner in Sind to the Secretary to Government Railway Department, Bombay.

Commissioner's Office, Kurrachee,
7 September 1867.

Sir,

I HAVE the honour to acknowledge receipt of your letter, No. 1791, dated 24th ultimo, and No. 3 P, dated 30th ultimo.

2. I have reason to think that the correspondence forwarded with my No. 913, dated 22nd ultimo, will have placed the question in a different form before Government from that in which it is regarded in your communications above acknowledged.

3. Under these circumstances I have thought it advisable to request the Collector to continue the proceedings on the part of Government, which had been initiated as reported in my No. 827, dated 7th ultimo.

4. Adverting to the last paragraph of your letter, No. 3 P, dated 30th ultimo, I beg to state that, as far as I can ascertain, no executions have yet been carried out; but it is understood that the Sind Railway Company have obtained judgment for a sum over 40,000 rupees; and copy of a letter received from the Agent, dated 6th instant, and of my reply of this date, is appended.

5. I submit also copy of the list of local liabilities of the Company received from the Agent.

6. It will now be apparent to Government that unless any definite instructions should be shortly received on the correspondence submitted with my No. 913, dated 22nd ultimo, the ordinary legal course is being pursued against the Company for recovery, and that it remains to be seen what view the Court may take of the action by the Agent on the telegrams from his authorities in England for staying execution.

7. The point for immediate consideration would appear to be whether, if the liquidators in England furnish such formal authority as would render it safe for Government to proceed with the mortgage, this engagement should, with the object of securing the property from being sold below its value, be entered into or not, and I have already submitted my opinion in the affirmative. In connection with this view, however, I would again press the point that the mortgage should be for the entire property.

8. If on the other hand the liquidators fail to give satisfactory authority, I see no alternative but to let the law take its course, which I should regret, because, as already stated, I consider that the property will be depreciated to a degree which it is impossible to estimate accurately, but which will probably only represent a fractional portion of 75,000 *l.*, the valuation fixed at the early stage of the negotiation.

I have, &c.

(signed) *W. H. Havelock,*
Acting Commissioner in Sind.

Enclosure 2, in No. 5.

LIABILITIES.

Wages due to Crews of following Steamers :					<i>Rs.</i>	<i>a.</i>	<i>p.</i>	<i>Rs.</i>	<i>a.</i>	<i>p.</i>
Jhelum steamer, 19	-	-	-	-	1,452	9	3			
Indus steamer, 38	-	-	-	-	4,130	14	-			
Gogra steamer, 8	-	-	-	-	3,777	10	-			
Ditto, supplementary	-	-	-	-	1,168	3	-			
Oobara steamer, 8	-	-	-	-	4,285	7	3			
Ditto, supplementary	-	-	-	-	490	-	-			
Soane, 15	-	-	-	-	7,117	12	-			
Lahore, Allahabad, and Shewan barges (lying at Kotree)	-	-	-	-	62	-	-			
Munora factory for May	-	-	-	-	787	7	-			
Ditto - - for June	-	-	-	-	778	5	-			
Ditto - - July	-	-	-	-	780	-	-			
Kotree factory for May	-	-	-	-	2,519	10	-			
Ditto - - for June	-	-	-	-	1,483	11	-			
Ditto, supplementary	-	-	-	-	110	8	-			
Kotree factory for July	-	-	-	-	749	10	-			
Salaries:—Kurrachee office for June	-	-	-	-	2,384	-	-			
" Ditto - - for July	-	-	-	-	1,384	-	-			
" Ditto - - for August	-	-	-	-	1,384	-	-			
								34,845	10	6
Notices to covenanted servants, as per agreement, and passages home					-	-	-	19,966	-	-
Debts due to Government and others :										
Fletcher & Mitchell, Bombay	-	-	-	-	205	8	-			
Lahore Chronicle	-	-	-	-	290	2	-			
Refunds to native merchants for twice payment of S. R. Co's charge	-	-	-	-	2,700	-	-			
Credit overdrawn at Mooltan	-	-	-	-	13,123	8	10			
Ditto - - at Sukkur	-	-	-	-	6,967	11	4			
Ditto - - at Kotree	-	-	-	-	300	-	-			
Ditto - - at Umritsur	-	-	-	-	Unknown.					
								23,586	14	2
+ Sind Railway Company, with costs of suit, about	-	-	-	-	41,000	-	-			
+ Forest ranger for wood fuel	-	-	-	-	50,000	-	-			
+ Deputy Commissioner Jhung	-	-	-	-	3,136	17	7			
Ditto - - - - Shahpore	-	-	-	-	4,742	-	11			
+ H. Sorabjee, for stores	-	-	-	-	8,313	6	8			
+ Fleming & Co.	-	-	-	-	1,819	-	-			
+ Conservator, River Indus	-	-	-	-	5,710	8	10			
+ Sind Railway workshops	-	-	-	-	108	-	-			
+ Oobarah steamer, about	-	-	-	-	80,000	-	-			
Margin for contingent expenses to cover claims for goods delayed, Bberry sunk, on Indus, with railway material, by Company's steamer "Soane," voyage 15	-	-	-	-	6,699	11	4			
Care of fuel on banks of river till transfer	-	-	-	-						
Unsettled accounts at Umritsur agency	-	-	-	-						
Support of office staff, &c., till transfer	-	-	-	-						
								2,01,601	7	4
								<i>Rs.</i>	2,80,000	-
ABSTRACT.										
Pressing liabilities, wages, and debts, &c.	-	-	-	-	78,398	8	8			
Margin for contingent expenses	-	-	-	-	6,699	11	4			
								85,098	4	-
Debts that may be covered by Government guarantee, as marked by a cross +					-	-	-	1,94,901	12	-
								<i>Rs.</i>	2,80,000	-

N.B.—Any discrepancies which may appear in this statement, compared with that furnished to Major Bonus, may be accounted for by not having received several of the accounts till just now, consequently many accounts, such as the Conservator, River Indus, H. Sorabjee's and Mooltan agency, were much under estimated.

(signed) Franklin Fox, Superintendent.

Enclosure 3, in No. 5.

(No. 771 G. of 1867.)

From the Acting Agent for the Liquidators, Oriental Inland Steam Company (Limited),
to the Commissioner in Sind.

Sir,

Kurrachee, 6 September 1867.

MAY I request the favour of a reply to a letter, No. 740, of 1867, I had the honour to address you on the 20th ultimo, submitting a copy of a telegram received by me from the liquidators in London, authorising me to mortgage to Government, "to pay executions" on the property of the Company here.

2. The telegram referred to requested a reply, but up to date I have been unable to answer satisfactorily, not having been informed officially of the intentions of Government in the matter.

3. With regard to the authority the telegram conveys to me, I would beg respectfully to point out to you, that as Government would be legally secure from all risk of loss in the transaction, whole responsibility of the mortgage, and the disposal of the monies, therefore, would rest upon me, for which I should be accountable to the liquidators and proprietors, and from which responsibility no action of Government in the matter could release me; as the best means of rescuing the Company from its present unfortunate position, I do not hesitate to take this responsibility upon myself.

4. The assurances conveyed to me by the collector and the Government counsel verbally of the favourable decision of Government in the matter, and that the deed was about being drawn up for signature, led to my holding out hopes of a speedy settlement of their claims to the servants and creditors of the Company, a proceeding which I believe the circumstances of the case warranted my doing, but which cannot be carried out, as the collector informs me the deed is not to be executed till further authority reaches me from England.

5. This unfortunate disappointment has of course aggravated the distress already suffered by the poor people waiting for a settlement of their wages, &c.

6. Trusting to a further and more favourable consideration of the case,

I have, &c.

(signed) *Franklin Fox,*
Acting Agent for the Liquidators.

Enclosure 4, in No. 5.

(Marine Department.—No. 1006 of 1867.)

From the Commissioner in Sind to the Acting Agent for the Liquidators, Oriental Inland Steam Navigation Company (Limited).

Sir,

Commissioner's Office, Kurrachee,
7 September 1867.

I HAVE the honour to acknowledge receipt of your letter, No. 771, dated 6th instant, and in reply beg to inform you that it does not appear to be safe for Government to proceed with the mortgage on the authority of the telegrams you have received, and that legal steps will, under present circumstances, be taken for the recovery of the claims of Government against the Oriental Inland Steam Navigation Company,

I have, &c.

(signed) *W. H. Havelock,*
Acting Commissioner in Sind.

Enclosure 5, in No. 5.

(No. 777 G. of 1867.)

From the Attorney for the Provisional Official Liquidators, Oriental Inland Steam Company (Limited) in Liquidation, to the Commissioner in Sind.

Sir,

Kurrachee, 16 September 1867.

I HAVE the honour to forward for your information, copy of a winding-up order made in the High Court of Chancery, in the case of the Oriental Inland Steam Company (Limited), and also a copy of the petition upon which it was granted.

2. I beg also to inform you, that I have received a power of attorney from the official provisional liquidators, appointing me to act as their attorney, and empowering me to transfer the steamers and property of the Company when the transfer is sanctioned by the Bombay Government.

3. I am also authorised to mortgage to Government in the event of your sanctioning the completion of the deed.

I have, &c.

(signed) *Franklin Fox,*

Duly Constituted Attorney of James Charles Bolton and
Robert Wilson, Provisional Official Liquidators
of the Oriental Inland Steam Company (Limited).

Enclosure 6, in No. 5.

A.

IN CHANCERY.

IN the matter of the Companies Act, 1862, and in the matter of the Oriental Inland Steam Company (Limited).

In Chancery.

Chancellor.

Chancellor Malins.

This petition marked A was produced and shown to Robert Wilson, and is the same petition as in his affidavit sworn before me this 13th day of August 1867, is referred to in the matter of the Companies' Act, 1862, and in the matter of the Oriental Inland Steam Company (Limited).

To the Right honourable the Lord High Chancellor of England.

12 August 1867.

S Lordship doth order that all parties
rned do attend him hereon, on the next
on-day hereof given notice forthwith.

(signed)

Chas. Cp. Percival,
Principal Secretary.

The humble petition of William Samuel Deacon of Birchm-lane, in the City of London, and Eric Carrington Smith, of Lombard-street, in the said City of London, Trustees for the Holders of Mortgage Bonds, and Creditors of the said Company, and the said William Samuel Deacon, and Robert Wilson, of No. 6, Billiter-street, in the said City, shareholders and contributories of the said Company,

Showeth,

The said Company were incorporated on the 19th day of December 1856, under the provisions of "The Joint Stock Companies' Act, 1856."

2. The nominal capital of the Company was originally 250,000 £.; but was afterwards increased to 500,000 £. (in 50,000 shares of 10 £. each), under powers by the articles of association vested in the directors.

3. The objects for which the Company was established, as stated in the said articles of association were, for establishing steam navigation on the rivers, seas, and waters of India, and making or improving such roads and other means of communication, holding such lands and buildings in India or elsewhere, purchasing or procuring such cargoes, and executing such works in connection therewith as might be required to promote the traffic necessary for the undertaking.

4. These have been issued, besides certain shares which have been forfeited, 41,467 shares, on which the whole of the 10 £. per share has been called up.

5. The said shares are divided into 34,347, known as A.B., and new issue shares, on which there is 4,120 £. in arrear, and 7,120 C. shares, on which there is 47,915 £. 13 s. in arrear, or thereabout.

6. The Company commenced business immediately after their incorporation, and thenceforth, and until very recently they have carried on the same.

7. The Company in the course of their business have sustained very heavy losses.

8. In the early part of the year 1864, the Company being much embarrassed, and having occasion for the sum of 80,000 *l.*, determined under the powers of their articles of association to borrow the same upon the security of a series of mortgage bonds, representing in the aggregate, the said sum of 80,000 *l.*

9. For better securing the holders of such bonds, the payment of such several sums, and the interest thereby secured, the Company by an indenture bearing date the 19th day of April 1864, assigned unto John Rogerson and the above named petitioners, William Samuel Deacon and Eric Carrington Smith (as trustees), all their lands, tenements, hereditaments, steamers, boats, and barges, and all calls there or thereafter payable in respect of the said C. shares upon trust, to secure to the holders of the said mortgage bonds, the repayment of the sum and interest thereby secured and subject thereto upon trust for the Company; and upon further trust, to permit and suffer the Company in the meantime, and until default in payment of the said principal monies and interest, to retain and keep possession of the said estate and effects, and to receive, take, and use all the rents, revenues, interest, income, and profits arising therefrom; and in the said indenture was contained a proviso, that if the Company should at any time make default in payment of any of the principal monies or interest, it should be lawful for the trustees, upon the requisition of the holders of bonds to the extent of 20,000 *l.*, to sell the said premises as in the said indenture mentioned.

10. Mortgage bonds have been from time to time, and principally in the year 1864, issued by the Company in pursuance of the said arrangement, to the amount of 59,390 *l.*, bearing interest at 8 per cent. per annum, payable at the end of five years, from the 31st day of March 1864, the interest being payable half-yearly in the meantime.

11. The interest on the said bonds has been duly paid up to the 31st day of March 1867, when half a year's interest amounting to the sum of 2,135 *l.* 12 *s.*, or thereabouts, became due, which is still in arrear and unpaid.

12. The said trustees have in hand a sum of about 4,907 *l.*, received from calls on the C. shares, together with a further sum of about 1,300 *l.* remitted from Calcutta, being the proceeds of sale of premises included in the said mortgage, making altogether about 6,207 *l.* available towards the payment of the said bonds.

13. The debts of the Company in India, independently of the said bond debts, amounted to the sum of 18,000 *l.*, or thereabouts, exclusive of a sum of 7,500 *l.* due to the Government of Bombay for unpaid purchase-money of a steamer.

14. The debts of the Company in London, independently of the said bond debts, amounted to the sum of 2,600 *l.*, or thereabouts.

15. The assets of the Company, with the exception of the unpaid capital, and the said sum in the hands of the trustees are principally in India, and consists of two large river steamers in Calcutta. Five river steamers and 10 barges, and a lighter, on the river Indus, and yards, buildings, land, fuel, stores, and plant, at Kurrachee, Munira, Kotree, Mooltan, Sukkur, Lahore, Umritsur, and elsewhere in India.

16. In consequence of the depressed state of trade, and of the unfavourable state of the river Indus, the business of the Company has been carried on at a considerable loss, and in consequence thereof, not only has the Company's Agent not been able to remit any monies to England during the last 14 months, but he has become more and more involved in debt, which he has no means of discharging; and by reason thereof, and of the pending of the negotiation next hereinafter mentioned, the steamers of the said Company have ceased running, and several telegrams have recently been received in London from the Agent of the said Company, stating that unless a large sum of money can be sent out, the property of the said Company will be seized and sold in execution by the creditors in India, who are pressing for payment of their claims.

17. Property of large amount liable to be so seized and sold is comprised in the said indenture of mortgage made for securing payment of the said bonds, and the interests of the holders of the said bonds may be seriously injured, unless immediate steps are taken to preserve their rights.

18. The said Company is, in fact, unable to continue to carry on its business by reason of the said pressing liabilities, and otherwise for want of means.

19. It is of great importance that the fleet of the steamboats, barges, and property of the said Company should be, as far as possible, preserved entire for the purpose of realisation, and that it should not be broken up and sold adversely and piecemeal by the creditors of the said Company.

20. A negotiation has for several months been pending with the Indus Steam Flotilla (which is a Company formed for objects similar to that of the Oriental Inland Steam

Company

Company (Limited) and which is carrying on its business on the river Indus under a contract with the Government of India), for the transfer to the said Indus Steam Flotilla, with the sanction of the Secretary of State for India in Council, of all the steamers, barges, land, buildings, stores, and other property of the said Oriental Inland Steam Company (Limited) on the line of river Indus; and on the 23rd day of May 1867, terms were finally accepted for such transfer, at the price of 75,000 *l.* stock of the Indus Steam Flotilla, if the Government of Bombay should consider the property worth so much to the Indus Steam Flotilla.

21. The matter has accordingly been remitted to Bombay for the report of the Government thereupon, and for its sanction to the proper transfer; but no report has, up to the present time, been received from the said Government of Bombay, and during the time necessarily occupied in the said negotiations and reference to that Government, the liabilities of the Company in India have become so pressing as seriously to endanger the existence intact of the property proposed to be transferred.

22. Your Petitioners, William Samuel Deacon, Eric Carrington Smith, and Robert Wilson, are shareholders and contributories of the said Company, holding respectively 100,000 and 50 shares therein.

23. Your Petitioners, the said William Samuel Deacon, and Eric Carrington Smith are jointly, with the said John Rogerson, creditors of the said Company, as such trustees as aforesaid, for the sum of 59,390 *l.*, and the interest thereon over due since the 31st of March last, as aforesaid, amounting to 2,135 *l.* 12 *s.*, making together 61,525 *l.* 12 *s.*; and your said last-mentioned Petitioners are also holders in their own right, or jointly with their respective co-partners of bonds, amounting to the sum of 20,000 *l.* and upwards.

24. Your Petitioners are advised that numerous questions will arise in the winding-up of the affairs of the said Company, which can only be settled satisfactorily under, and with the aid of the provisions of the said Act, and that it is just and equitable that the said Company should be wound up by the Court under the provisions of the Companies Act, 1862.

25. It is expedient that the official liquidators of the said Company should be forthwith provisionally appointed, as matters of great moment are and will be immediately calling for determination, and that they should authorise an Agent in India, by telegram or otherwise, for the preservation of the property there, and for the maintenance of equal rights among all the creditors, and the further conduct of the said negotiations with Indus Steam Flotilla.

26. The head office of the said Company, and its registered place of business is at No. 6, Billiter-street, in the City of London.

27. Your Petitioners therefore humbly pray your Lordship that the Oriental Inland Steam Company (Limited) may be wound up by this Honourable Court under the provisions of the Companies Act, 1862, and that all proper and necessary directions may be given for that purpose, and that official liquidators may be provisionally appointed, and that your Lordship will be pleased to make such further or other order in the premises as the nature of the case may require, and to your Lordship shall seem meet, and your Petitioners will ever pray, &c.

IN CHANCERY.

Vice Chancellor Malins, at Chambers.

Tuesday, 13th August 1867.

IN the matter of the Companies Act, 1862, and, In the matter of the Oriental Inland Steam Company (Limited).

ON the application of William Samuel Deacon, Eric Carrington Smith, the said William Samuel Deacon and Robert Wilson, and upon hearing the solicitors for the said applicants, and upon reading an affidavit of William Powell Williams, filed the 13th of August 1867, and the exhibit thereon referred to an affidavit of James Allan, filed the said 13th of August, an affidavit of James Worley, filed the same day; and an affidavit of the said Robert Wilson, filed the same day; and the exhibit therein referred to; the judge doth hereby appoint James Charles Bolton, of 122, Leadenhall-street, in the City of London, public accountant, and the said Robert Wilson, of No. 6, Billiter-street, in the City of London, the secretary of the said Company, provisionally, official liquidators of the above named Company, without security: And the said judge doth hereby limit and restrict the powers of the said James Charles Bolton, and Robert Wilson, as such provisional official liquidators to the following acts, that is to say: to the taking possession and the safe



custody of the river steamers, barges and lighters, yards, buildings, land, fuel, stores, and plant, and other property and effects of the said Company, as well in India as in England, and to the taking of such proceedings as may be necessary for those purposes.

(signed) *F. E. Edwards,*
Chief Clerk.

(B. 1867, folio 2186).

Pursuant to the Act 14 & 15 Vict. c. 99, s. 14. I hereby certify the above to be a true copy of the record in my custody.

(signed) *F. Bedwell,*
Clerk of Records and Writs of the High Court
of Chancery in England.

Enclosure 7, in No. 5.

(No. 792 G. of 1867.)

FROM the Attorney for the Liquidators, Oriental Inland Steam Company (Limited), to the Commissioner in Sind.

Sir,

Kurrachee, 23 September 1867.

MAY I request the favour of being informed whether any intimation has yet reached you, of the decision of Government on the transfer or otherwise of this Company's property to the Indus Steam Flotilla Company.

2. As I have had the honour to submit to you, great distress is felt by the servants of the Company, with whom it is impossible for me to effect a settlement of their wages until the decision of Government on this point is arrived at.

3. It is also impossible for me to carry out any plans for the utilisation or disposal of the property placed under my charge as liquidator, until the question whether it is to be transferred to the Indus Steam Flotilla or not, is finally disposed of.

4. I trust that you will be pleased to take into consideration the urgency of the matter set forth above, to those concerned, and that you will cause an application for its decision to be telegraphed to Her Majesty's Government at Bombay, or in the event of your disapproving such a course, that this application may be forwarded to his Excellency the Governor.

(signed) *Franklin Fox,*
Constituted Attorney of James Charles Bolton and
Robert Wilson, Provisional Official Liquidators.

Enclosure 8, in No. 5.

(Marine Department.—No. 1,092, of 1867.)

Commissioner's Office, Kurrachee,
24 September 1867.

TRUE Copy, together with copy of letter No. 777, dated 16th instant, and accompaniments, from Mr. Fox, submitted to Government, with reference to the Acting Commissioner's, No. 913, dated 22nd ultimo, and 1,007, dated 7th instant, which show that Major Bonus and Mr. Wood, agent for the Flotilla Company, are opposed to transfer of any of the vessels.

2. The Acting Commissioner had hitherto supported conditionally the plan of Government taking the property on mortgage, but he regrets to state that under the circumstances set forth in the papers now submitted, he does not consider that Government could be advised to take any lien on the vessels; and, as already reported, legal proceedings are being carried out by the Collector of Kurrachee, on account of Government.

(signed) *W. H. Havelock,*
Acting Commissioner in Sind.

— No. 6. —

(Railway—No. 1).

RAILWAY DESPATCH from Secretary Sir *Stafford Northcote* to the Governor in Council at Bombay.

Sir,

India Office, London, 7 January 1868.

WITH reference to your letters of the dates noted in the margin*, herewith is transmitted, for your Excellency's information, copy of a correspondence with the official liquidators of the Oriental Steam Navigation Company, on the subject of the provisional arrangement entered into between that Company and the Sind Railway Company for the purchase by the latter of the property of the former on the river Indus.

* No. 27, dated 24th August 1867.
 " 30 " 28th September 1867.
 " 34 " 31st October 1867.

I have, &c.

(signed) *Stafford H. Northcote.*

His Excellency the Right Honourable
 the Governor in Council, Bombay.

Enclosure 1, in No. 6.

Oriental Inland Steam Company (Limited) [in liquidation].

Sir,

6, Billiter-street, E.C., 25 October 1867.

REFERRING to the correspondence which has taken place in regard to the transfer of the property of this company on the River Indus, to the Indus Steam Flotilla, and specially to your letter No. 3456, dated 16th May last, which conveyed to the then Directors, the intimation that the Right honourable the Secretary of State for India had sanctioned the payment by the Indus Steam Flotilla, of 75,000 *l.* in the stock of that company, should the Bombay Government consider the property in question to be worth so much to the Indus Flotilla Company; we beg permission to draw the attention of the Right honourable the Secretary of State for India, to the fact that up to the present date, now upwards of five months, since the directors signified their assent to these terms, no intimation has reached us of the Bombay Government having arrived at a decision upon the question submitted to its consideration.

The directors of this company were under the impression when they acquiesced in this arrangement, that the matter had been practically concluded by the action of the Secretary of State for India, and that the reference of it to the Government of Bombay, was simply required for the purpose of confirmation, on a verification of the property in question, prior correspondence, and personal communication with the Right honourable the Secretary of State for India, and certain members of his Honourable Council, as also with Mr. Andrew, Chairman of the Indus Steam Flotilla, having established these two main points of agreement, viz.: 1. That the sum arranged was not in excess of what it would be the interest of the Indus Steam Flotilla to give for the property; and, 2. That this was the lowest amount this company ought to receive in consideration of the great efforts it had made, involving a very large expenditure of capital, to develop the trade of Western India, and in consideration of the very serious losses it had incurred in the undertaking. For, we beg respectfully to point out to the Right honourable the Secretary of State for India, that the question which the Directors consented to refer to the Government of Bombay, was not the intrinsic value of the property, but its relative value, its value to the Indus Steam Flotilla; and that the Directors of the Indus Steam Flotilla had already given their decision upon this point by a verbal communication of the Chairman of that Company to the Secretary of the Oriental Inland Steam Company; whereupon the Directors of this Company forwarded to you their letter of the 23rd May last, and on the same day received from the Secretary of the Indus Steam Flotilla, a letter of that date, fully confirming the verbal statement previously made by the Chairman of that Company.

Moreover, this view is confirmed by the statement which the Chairman of the Indus Steam Flotilla, made to the shareholders of that company, at the meeting held on the 25th June last, in reference to the following paragraph of the report of the Directors of the Indus Steam Flotilla, issued preparatory to the annual general meeting held that day:
 Paragraph—

"Negotiations have for some time past been in progress with a view to a transfer of the vessels and property of the Oriental Inland Steam Company, on the Indus, to the Indus

Steam Flotilla, and the Directors trust soon to be able to announce that an arrangement has been concluded with that object, of such a nature, as will be satisfactory to the proprietors."

On that occasion Mr. Andrew, Chairman of the Indus Steam Flotilla, is reported to have said (as given in the "Mining Market Review," of 29 June), "We have applied to Government for sanction to the arrangements entered into for the transfer of the vessels of the Oriental Inland Steam Company, on the Indus, at a rate which will be considered when I am in a position to communicate the exact terms, highly advantageous to the proprietors."

We submit that it is perfectly clear from this statement, that the Directors of the Indus Steam Flotilla had both deliberately agreed to definite terms of purchase, and further, that they considered these terms highly advantageous to the proprietors of that company. That the Chairman and Directors were correct in that view, is already shown by the fact that the rates of freight have risen to more than double those prevailing before the stoppage of our traffic, by which it would appear that the value of our good-will, independently of the large plant to be handed over, is so great, that the entire sum to be paid for the property will be fully covered on up-freights alone, within a period of three years. Further, the down-freights being fully 60 per cent. of the earnings on the Indus, it would naturally follow that in about 16 months the rise in freight will cover the entire purchase-money, and give the Indus Steam Flotilla the plant for nothing.

Bearing these facts in mind, the Directors of this Company were, we think, justified in expecting to receive an official intimation of the confirmation of the terms of transfer by the return mail from India at the end of July or early in August last; and, disappointed as they were, on learning at the India Office that no official communication had, up to that time, been received from the Government of Bombay, they have not ceased to expect that each mail, as it was delivered, would bring the expected information.

Up to the present time, however, no such communication has been received; but, on the contrary, by the last letters we are informed that the committee, which had been appointed to report upon the property, had advised against the purchase of it by the Indus Steam Flotilla. We cannot refrain from expressing our astonishment at this, and from stating that the action of this committee in advising upon the question of the purchase of the property at all is, in our judgment, a violation of the understanding entered into on this side as shown in the foregoing reference to the letter of the 23rd May, coupled with the statements made in the report and by the chairman of the Indus Steam Flotilla, and borne out by the correspondence which had previously taken place on the subject. The point contended for throughout the correspondence was that the Company should receive some security that a definite sum should be given for its property before it consented to the reference of the matter to the Government of Bombay, and that both sides should signify their assent as to what this definite sum should be. The Directors of this Company were thoroughly explicit on the point, and we are bound to admit that the same explicitness marks the communications of the Indus Steam Flotilla of the 23rd May, and of the Chairman of that Company; but we are also bound, in justice to the interests we represent, to state that the subsequent course of events does not appear to us to be in harmony with these communications, and we think we have cause to complain of this as indicating the apparent want of good faith in carrying out the original understanding.

The correspondence and instructions would, in the ordinary course, reach the Government of Bombay about the middle of June, and it was not until about three months after this that our agent was informed by the Commissioner in Sind that a committee, consisting almost exclusively of officers of the Indus Steam Flotilla, had advised the Government of Bombay against the purchase of a property which the Directors of that Company had expressed their willingness to purchase at an agreed price, and which expression of willingness to purchase had induced the Directors of this Company, relying on the good faith of the Government of India, and of the Directors of the Indus Steam Flotilla to consent to refer the matter, for final sanction, to the Government of Bombay. Thus, three months of most valuable time have been consumed; and at the end of that period a report has been sent in which, in our judgment, it was a violation of good faith to require or accept. We might, we think, in justice reflect upon the composition of this committee, the large part of its members consisting of officers of the Indus Steam Flotilla.

Meantime, relying upon the honourable completion of the negotiations, the vessels of the Company have been laid up; no attempt to dispose of them or to employ them has been made, while heavy expenses have unavoidably run on in preserving the property intact and in good condition, in the daily expectation they would be terminated by the announcement that the Government of Bombay had given its consent to the transfer.

We cannot but believe that these facts will, on consideration, be regarded by the Right hon. the Secretary of State for India as affording ample justification for our offering a respectful remonstrance, as official liquidators appointed by the Court of Chancery, against the course which has been pursued, and of our pressing for the completion of the transfer on the terms agreed, and which are stated by the purchasers, and proved by events to be most advantageous to them, without further delay.

With

With the view of explaining at greater length the position in which the case stands, and in order the more speedily to promote a satisfactory settlement, we venture, in conclusion, to solicit at the hands of the Right. hon. the Secretary of State for India the favour of his receiving a deputation of those interested in this Company, at such an hour and place as it may be convenient to him to appoint.

We have, &c.
(signed) *J. C. Bolton,* }
Robert Wilson, } Official Liquidators.

The Under Secretary of State,
India Office.

Enclosure 2, in No. 6.

Gentlemen,

India Office, 21 November 1867.

I AM directed by Sir Stafford Northcote to acknowledge the receipt of your letter of the 25th ultimo, relative to certain proposals for the purchase by the Indus Flotilla Company of the vessels and other property on the Indus belonging to the Oriental Inland Steam Navigation Company.

The proposed purchase, as correctly stated in your letter, was to be carried into effect only in the event of the Bombay Government, to whom the matter was to be referred by the Secretary of State, considering the property in question to be worth to the Indus Flotilla Company the price offered by them.

I am now to acquaint you that, in reply to the reference made to them, the Government of Bombay have reported that they do not consider it advisable that the property of the Oriental Inland Steam Navigation Company should be purchased by the Flotilla Company. The negotiation, therefore, necessarily came to an end. Under these circumstances it does not appear to Sir Stafford Northcote that anything is to be gained from a personal interview, as proposed in your letter; indeed, he considers it much better, in order to avoid any chance of misconception, that any intercourse on the subject between yourselves and this office should be by correspondence.

J. C. Bolton, Esq.
Robert Wilson, Esq.

I am, &c.
(signed) *J. Cosmo Melvill.*

Enclosure 3, in No. 6.

6, Billiter-street, London, E.C.,
November 1867.

Sir,

WE beg leave to acknowledge the receipt of Mr. Melvill's letter of the 21st instant, and have with regret to state that we cannot concur in the conclusion that the negotiation with the Indus Steam Flotilla came to an end by the fact of the Bombay Government intimating that it did not consider the purchase advisable.

Acting in our capacity as liquidators of the Oriental Company appointed by the Court of Chancery, we beg to say that in our opinion, the arrangement amounted to much more than a negotiation; and that on the faith of it we find that the position of the Oriental Inland Steam Company has been very seriously altered; and we must be excused for pointing out that, on the face of Mr. Melvill's letter, it is apparent both that the question which the contracting companies agreed to refer to the Bombay Government, viz. whether the property was worth to the Indus Steam Flotilla the price offered by them, has not been answered; and that the opinion of that Government as to the advisability of the purchase has in truth no bearing on the question.

We regret that in the letter now under acknowledgment no reference is made to the facts mentioned in our communication of the 25th ultimo, which we must therefore beg permission to press once more upon your attention.

The question which the Oriental Company, then a going concern, consented to submit to the Government of Bombay, was simply whether their property, goodwill, and trade connection were, in the opinion of that Government, then of the value to the Indus Steam Flotilla of 75,000 *l.* of Flotilla stock.

We are satisfied that this question admitted of but one answer, and that in the affirmative.

The Government of Bombay does not appear to have entered upon the reference, or to have applied itself impartially to this question at all, but to have referred in effect to the Agents of the Flotilla, the general consideration as to whether the purchase was "advisable" or not. This point had been determined on this side at the very first stage in the negotiations, now more than a year ago. We note that in the conference which some of the Oriental Directors had with the Chairman of the Flotilla, on a question relating to traffic arrangements as far back as July 1866, that gentleman, of his own accord, opened the subject of amalgamation, and stated that he had been prepared to give the Company 200,000 *l.* for its property, and to get rid of competition at the beginning of 1864; the

property of the Oriental Company now on the river being considerably more and of greater value than it was in 1864; and that this observation led to further discussion, and the matter of the advisability of a transfer was so clearly set forth, and such liberal expectations held out, that the Oriental Directors were induced to proceed with the negotiations, and the advisability having been mutually agreed upon, all after-discussion turned upon the value of the property and the amount to be paid for it.

The Directors of the Flotilla expressed themselves desirous of making the purchase; they were indeed willing to give more than the price named; but stated that the Indian Government objected; and finally 75,000*l.* was fixed, in consequence of a personal interview which you granted to the representatives of the Oriental Company, subject only to the condition that the Bombay Government were to be of opinion that the property was worth as much to the Flotilla. If the transaction had been carried out on the other side by the Agents of the Flotilla in the same spirit, the transfer might have been promptly closed; and we do not for one moment believe that you intended that the Oriental Company should be placed at the mercy of the local Agents of the Flotilla, or that the condition precedent which you then prescribed, which was very exactly defined, should be used by them as a means for nullifying all the Home proceedings relative to the transfer; And we submit that, on the ground of the Government of Bombay having misapprehended its position in the business, the opinion it has expressed can in no way be regarded as final.

The altered position of the Company since the 23rd May, the date of the Flotilla's letter, accepting the price named, materially strengthens, in our judgment, the case of the Oriental Company. At that time its affairs were practically unembarrassed, its liabilities were within compass, and all would have been easy of liquidation had the transfer gone through in the manner which we think there was ample reason to expect. The matter after that date was in the hands of the Government of Bombay. The history of the Company was known to that Government; its past struggles and losses and the services it has rendered to commerce in India. The Government of Bombay was aware of the recommendation of a subsidy which the late Governor had made in its behalf; there was therefore every reason to place confidence in the impartial action of the Government of Bombay when the Oriental Company consented to make it the arbitrator on the one question so particularly defined as mentioned above, everything else having been already determined here.

It would appear, however, that the Government has mistaken the reference; for after much prejudicial delay, we find that (instead of proceeding independently or in the presence of both parties) it appointed a committee, consisting mainly of Indus Flotilla officers, and generally biassed against the Oriental Company, to report upon the property.

The Agent of the Oriental Company has received no information as to the proceedings of this committee; no notice of its sittings was given to him; we have had no copy of its report, notwithstanding repeated request for it by our duly constituted attorney and agent.

We have reason to believe that all the members of this committee were wholly opposed to the transfer taking place at all, and that they were led to misconceive and so to misrepresent the condition of the property, and then formally to give that advice which appears to have determined the decision of the Government of Bombay.

We have to urge that the Bombay Government was bound either fairly to hear both sides, or not to communicate with either.

During the period from May to October, nearly five months, the steamers, property, and staff of the Oriental Company were necessarily kept unemployed; the connection and good-will were being practically broken up and absorbed by the Flotilla; the competition which the Flotilla had often acknowledged to be so serious was being got rid of. This appears from the fact that almost as soon as the Flotilla had the river to themselves, and before the decision of the Bombay Government was made known, the Flotilla doubled its scale of freights. The delay which thus occurred was most prejudicial, for expenses were running on at a ruinous rate, with no earnings whatever coming in against them.

And we find with much regret that in the meantime the Scinde Railway Company (which practically is one with the Flotilla) were putting the utmost pressure upon the Oriental Company for a debt of 4,000 *l.*, at the very time when the means of payment were locked up by the treaty for purchase made by the Flotilla. This pressure even went so far as to threaten an execution and sale while the committee was supposed to be deliberating on the property; and the Government of Bombay, influenced, as we cannot but fear, by the hostile opposition before referred to, added to the embarrassment of the Company by pressing for the payment of an amount owing for wood, fuel, and the steamer Oobarah, while that fuel and the steamer and all other property and means of payment were being at great expense maintained intact, in order that the Company might faithfully carry out their arrangement with the Flotilla.

Thus, as it appears to us, the Oriental Company has been placed in a position of serious injury by the action of the Government, on whose justice and equity it relied; and advantage appears to have been taken by the local Agents of the Flotilla of the good faith with which it consented to refer the matter to the Bombay Government. The Oriental Company has been literally run off the river (where it was established earlier than the Flotilla) by the action of the guaranteed Company carrying all the favour and influence of Government, and running at ruinous rates of freight; and when driven to sell its property to the Flotilla thus protected, and in which, as we are informed, the Government of Bombay is virtually a partner (holding the stock of the Indus Flotilla in payment for the

the boats transferred to it in 1864), the real question submitted to it is passed over by the Bombay Government, and an adverse decision is given against the manifest sense and effect of the pending negotiations and correspondence, and the injustice of which is aggravated by the steps which in the interval were taken to depreciate the property and embarrass the financial position of the Company.

We are wholly at a loss to account for the entire variance which exists between the assurances and good faith apparently intended throughout the business by the Board of the Flotilla in London and the directly contrary policy of their Agents in India.

On the question of value we would venture to add, that the Chairman of the Flotilla, on the day on which the arrangement was concluded, himself stated that the Flotilla was fortunate in the arrangements about to be carried out, as by removing an active rival it would have the command of the entire traffic of the Indus, and that he considered the vessels and other property about to be acquired well worth to the Indus Flotilla the payment to be made: and at the half-yearly meeting of the shareholders of the Flotilla, held a month later, he again stated that the arrangement for the transfer was at a rate which would be considered (when he was in a position to state the exact terms) "highly advantageous to the Flotilla proprietors. And it could not be otherwise; for besides removing all competition, the property itself had cost 150,000*l.*, was in good working order, ready, and on the site of operation; 16,000*l.* out of revenue had been expended upon it during the last preceding three years; and it has actually earned, during the same three years, an average gross annual revenue of 47,484*l.* 7*s.* 7*d.*; although in the latter part of that period the rates of freight had been forced down to half what the Flotilla charged immediately that the steamers of the Oriental Company were taken off the river.

We respectfully beg to request that we may be furnished with a copy of the proceedings and report of the committee to which we have referred, and also with copies of the communications which have taken place between the Flotilla and its Agents and the Bombay Government on the subject.

We have also respectfully to request that you will take upon yourself the burthen of hearing the question referred to the Government of Bombay, or that you will suggest some other tribunal before whom that question may be brought; in either case permission being accorded to us to substantiate our position, and to bring forward the evidence and information in our possession. And we beg to repeat that we are prepared to prove that the property was well worth to the Indus Steam Flotilla the price which that Company offered, and were willing and agreed to give; and thus we are able, as we are advised, to fulfil the only condition necessary to the establishment of our right to require the arrangement to be now carried out; and we may add, that the chief clerk of Vice-Chancellor Malins, in whose court the winding-up is, has directed us to keep the property intact, in order that we, on our part, may be ready to carry out the transfer.

We have, &c.
(signed) *J. C. Bolton.*
Robert Wilson.

The Right hon. Sir Stafford Northcote, Bart.,
Secretary of State for India in Council.

Enclosure 4, in No. 6.

Gentlemen,

India Office, 12 December 1867.

I AM directed to acknowledge receipt of your letter of the ultimo, and in reply, to remind you that the agreement entered into by the Indus Flotilla Company, with the sanction of the Secretary of State, for the purchase of the vessels and other property on the Indus of the Oriental Inland Steam Navigation Company, was merely provisional. The intimation made to the Directors of the latter Company was, as correctly described in your letter of the 25th October last, viz. "That the Right honourable the Secretary of State for India had sanctioned the payment by the Indus Steam Flotilla of 75,000*l.* in the stock of that Company, should the Bombay Government consider the property in question to be worth so much to the Indus Flotilla Company." The Bombay Government has, however, decided that the property in question is not worth the sum named to the Indus Flotilla Company, and the provisional agreement, as stated in Mr. Melvill's letter of the 21st ultimo, has, in consequence, come necessarily to an end.

With reference to the request contained in the latter part of your letter, Sir Stafford Northcote must decline to furnish you with a copy of the proceedings of the committee appointed to report on the vessels, or with copies of communications on the subject, which have passed between the Directors of the Flotilla Company and their Agent, and between the latter and the Bombay Government.

I am, &c.
(signed) *Herman Merivale.*

J. C. Bolton, Esq.
Robert Wilson, Esq.

Enclosure 5, in No. 6.

Oriental Inland Steam Company (Limited) [in Liquidation],
6, Billiter-street, E. C., 19 December 1867.

Sir,

WE have the honour to acknowledge the receipt of your letter of the 12th instant, in which you state that the Bombay Government has decided that the property in question is not worth the sum named to the Indus Steam Flotilla Company; but we must be allowed to assure you that, not only is this the first intimation to that effect that has reached us, but that, unless we are entirely misinformed, the Bombay Government had not taken the means of informing themselves on the subject, which alone could enable them to arrive at an impartial conclusion.

Under these circumstances we think the Secretary of State for India will see that it is due to the Court of Chancery, and to us, as liquidators of the Oriental Inland Steam Company, that a copy of the decision, and the grounds for it, should be furnished to us.

We are, &c.
(signed) *J. C. Bolton,* } Official Liquidators.
Robert Wilson, }

The Under Secretary of State for India,
India Office.

Enclosure 6, in No. 6.

Gentlemen,

India Office, 23 December 1867.

I AM directed by the Secretary of State for India to acknowledge receipt of your letter of the 19th instant, and to acquaint you in reply that he has nothing to add to the communications already addressed to you on the subject of the provisional agreement entered into between the Indus Flotilla and the Oriental Inland Steam Navigation Company, to which your letter refers.

J. C. Bolton, Esq.
Robert Wilson, Esq.

I am, &c.
(signed) *Herman Merivale.*

No. 7.

(Railway Department,—No. 40 of 1867.)

RAILWAY DESPATCH from the Governor in Council at Bombay to Her Majesty's Secretary of State for India, London.

Bombay Castle,
28 December 1867.

Right honourable Sir,

From the Consulting Engineer
for Railways, No. 4002, dated
14th November 1867, with accom-
paniments.

IN continuation of our Despatch, No. 34, dated 31st October last, we beg to forward further papers relating to the Oriental Inland Steam Navigation Company.

2. You will observe from these papers, that the position of Mr. Wood, the Superintendent of the Indus Steam Flotilla Company, and Major Bonus, the Deputy Consulting Engineer for Railways in Sind, is, that they now recommend what a very few weeks ago they expressed a decided opinion against. The purchase of the property in question was approved by you in your Despatch No. 14, dated 18th May last, subject to the opinion of this Government as to its value to the Indus Steam Flotilla Company being equal to 75,000*l.*; and the purchase would probably have been effected but for the representations to the contrary of Major Bonus, and the fact that the Company fell into embarrassments from which it has been found necessary to call in the Court of Chancery to extricate them.

3. We do not see how this Government can now be called on to sanction the purchase for a less sum than they were prepared to recommend in the first instance.

We have, &c.
(signed) *W. R. S. V. Fitzgerald.*
S. Mansfield.

Enclosure 1, in No. 7.

(No. 4002 of 1867.)

Railway Consulting Engineer's Department,
Bombay, 14 November 1867.

COPIES submitted for the orders of Government.

2. The principal reason assigned for the proposal to purchase the steamers of the Oriental Inland Steam Navigation Company is, that they may otherwise be used in competition with the Indus Flotilla Company.

3. But, on the other hand, the steamers are said not to be well adapted to the navigation of the river, and it seems undesirable that the Flotilla Company should lock up a large amount of capital 62,000 *l.* + 13,000 *l.* for repairs and refitting, when that amount could be more profitably invested in boats of a superior description and better adapted for the carrying trade on the river.

4. The steamers of the Oriental Company were, it is believed, intended to act chiefly as tugs, and are not well adapted for carrying goods.

5. It will be in the recollection of Government, that Major Bonus, in reporting the condemnation of the steamer "Sir C. Wood," showed that she had been worked at a loss, and the same might very probably be the case with these steamers.

(signed) *A. De Lisle*, Colonel, R. E.,
Consulting Engineer for Railways.

Enclosure 2, in No. 7.

(No. 1760 of 1867.)

From the Deputy Consulting Engineer for Railways in Sind, Kurrachee.

Office of Deputy Consulting Engineer for Railways,
in Sind, Kurrachee, 4 November 1867.

Sir,

WITH reference to Government resolution, No. 2133, of the 14th ultimo, I have the honour to forward herewith a letter from the Agent and Superintendent of the Flotilla, in which that gentleman suggests that his Company should be authorised to purchase the Oriental Inland Steam Navigation Company's property for 62,000 *l.*

2. I may observe that the original proposal received from England was for the transfer of the property for 75,000 *l.* in Flotilla Stock at par. This was the sum agreed upon between the two Companies in London; but, for reasons which I need not detail here, neither the agent and superintendent of the Flotilla, nor myself, thought it advisable that the purchase should be completed.

3. It appears, however, that the London Board of the Flotilla Company is still very desirous of purchasing the property, hence this request for sanction to offer 62,000 *l.* for it.

4. If this was a mere question of purchasing certain vessels, &c., for 62,000 *l.*, I should certainly not recommend the proposal for the approval of Government, for I am decidedly of opinion that for 62,000 *l.*, vessels better adapted to the navigation of the river might be built; in fact, that the money might be laid out to greater advantage.

5. But looking at the results of the keen competition during the past year between the Flotilla and the Oriental Companies, and considering that the steamers of the latter Company are the only ones on the river besides those of the Flotilla, and that if the Flotilla does not purchase them somebody else certainly will, and at such a low figure as will probably make it possible for the vessels to be worked at profit, I cannot but think that the Flotilla Company would do wisely in buying the property if it can be had on reasonable terms.

6. If, however, Government desire to re-establish the competition of steam companies on the Indus, the purchase of the Oriental fleet by the Flotilla should not be approved. I think myself that such a competition is of no advantage; it is unfortunately too evident that there is not sufficient paying traffic for two companies, and until a railway is made the interests of trade would be better served by the maintenance of one healthy and efficient Company.

7. In conclusion, I would suggest that the approval of Government be granted to the purchase of the Oriental Company's property for 62,000 *l.*, provided that the Home Government and the London Board are of the same opinion.

I have, &c.
(signed) *J. Bonus*, Major, R.E.,
Deputy Consulting Engineer for Railways
in Sind.

To the Consulting Engineer for Railways,
Bombay.

Enclosure 3, in No. 7.

(K. 141.)

To Major *Bonus*, Deputy Consulting Engineer for Railways in Sind.

Indus Steam Flotilla, Kurrachee,
2 November 1867.

Sir,

I AM in receipt of your No. 1716, of the 28th October, enclosing a Government Resolution, No. 2133, of the 14th October 1867, upon the proposed transfer to the Flotilla of the Oriental Inland Steam Navigation Company's property.

2. Hitherto it has been most difficult to get at the gross liabilities of the Oriental Inland Steam Navigation Company, and whilst there was any uncertainty in this very important matter, no arrangement for the purchase of the property of this Company could be made without incurring contingent risks.

3. But now that the Oriental Inland Company are winding up their affairs under the protection of the Court of Chancery, the conditional offer to purchase their property, which was made in England, can now be reconsidered without in any way jeopardising the interests of the Indus Flotilla Company.

4. I may remark, parenthetically, that the observations which I considered it my duty to make on the fleet of the Oriental Inland Steam Company, in No. 27 K, of 1st August 1867, are as true now as when they were written; but the question of whether this Company should purchase their vessels does not entirely hinge on the fact that better vessels might be constructed than those belonging to the Company in liquidation.

5. There are other considerations, besides the foregoing, which must be taken to account, and the Board, having given due weight to these, are still willing to purchase the property of the Oriental Inland Steam Navigation Company at its full value to the Indus Steam Flotilla Company.

6. The fleet in question I have had examined by the officers in the margin, and basing my appraisalment of its value from these reports on the present state and condition of each vessel in it, coupled with my own knowledge on this subject, I would name (62,000 *l.*) sixty-two thousand pounds as the worth of the Oriental Inland Steam Navigation Company's property ashore and afloat to the Indus Steam Flotilla Company.

7. The sum is less by 13,000 *l.* than the conditional offer made by the Board of Directors.

It will take the sum named to put the vessels into fair working order.

8. I have now to request you will be good enough to obtain the sanction of the Government to my Board purchasing the entire property (ashore and afloat at Kotree, Kurrachee, and Manora) of the Oriental Inland Steam Navigation Company (Limited), for the sum of (62,000 *l.*) sixty-two thousand pounds, payment to be made as the Board of Directors may consider best for the Indus Flotilla Company.

I have, &c.
(signed) *J. Wood*,
Agent and Superintendent.

Captain Fletcher
(Government).
Captain Jones (Flotilla).
Mr. Jacob (Flotilla),
Chief Engineer.

— No. 8. —

(Railway, No. 10.)

RAILWAY DESPATCH from Secretary Sir *Stafford Northcote* to the Governor in Council, Bombay.

Sir,

India Office, London, 29 February 1868.

Para. 1. I HAVE received your Excellency's Despatch of the 28th December last, No. 40, relative to the recent negotiations between the Indus Flotilla and the Oriental Inland Steam Navigation Companies, for the purchase of the vessels and other property of the latter, and I fully approve of your proceedings in the matter.

2. Since the receipt of this Despatch, I have been in communication with the Flotilla Board on the subject, and now forward a copy of a letter from them, with an enclosure, No. 2789, dated the 11th instant. The Board, you will observe, state that it has given them satisfaction to find that your Government have not sanctioned the purchase to which they had conditionally agreed, as they have since learnt that the property has much deteriorated in value; but they are still of opinion that it would be desirable for their Company to obtain possession of the vessels and other property on the Indus belonging to the Oriental Inland Steam Navigation Company, at a price not exceeding 30,000 *l.* in the capital stock of the Flotilla Company at par. I am of opinion, however, after carefully considering the matter, that it is not now for the interest of the Flotilla Company that they should purchase the vessels and other property referred to, on any terms, and have informed the Board accordingly.

I have, &c.

(signed) *Stafford H. Northcote.*

His Excellency the Right Honourable
the Governor in Council, Bombay.

Enclosure 1, in No. 8.

(No. 2789.)

Indus Steam Flotilla Office,
Gresham House, Old Broad Street, London,
11 February 1868.

Sir,

IN pursuance of a resolution of the Board, I have the honour to request that you will do me the favour to submit to the Secretary of State for India in Council, for his information, the annexed extract from the Minutes of a meeting of Directors of the Indus Steam Flotilla, held on the 5th instant, in reference to the recent negotiations for the transfer of the vessels and property of the Oriental Inland Steam Company upon the Indus to the Indus Steam Flotilla.

I am, &c.

(signed) *W. P. Andrew,*
Chairman.

The Under Secretary of State
for India.

Enclosure 2, in No. 8.

EXTRACT from the Minutes of a meeting of Directors of the Indus Steam Flotilla,
held on the 5th February 1868.

"A précis of correspondence, &c., relative to the purchase, by the Indus Steam Flotilla, of the vessels and property of the Oriental Inland Steam Company was submitted by the Government Director, for the information of the Board.

"Since it was arranged, with the sanction of the Secretary of State, that the property of the Oriental Inland Steam Company should be purchased by the Indus Steam Flotilla for the sum of 75,000 *l.* in shares of the latter at par, in the event of the Bombay Government considering the property worth so much to the Flotilla, the Board have had reason to believe that the property has much deteriorated, and that its value is far below the sum named. The Board accordingly learned with satisfaction that the Bombay Government had not sanctioned the arrangement, and that the negotiations had consequently broken down.

“ The Board, however, are still of opinion that it would be desirable to obtain possession of the property of the Oriental Inland Steam Company, if it could be purchased upon reasonable terms; but they consider that 30,000 *l.* in Indus Steam Flotilla Stock at par is the highest amount that can with propriety be offered; and this they would prefer to leave subject to the approval of the Bombay Government, as deterioration of the property is doubtless still going on.

“ Resolved,—That a copy of the above Minute be forwarded to the Secretary of State for India in Council, for his information.”

True extract,
(signed) *W. P. Andrew,*
Chairman.

Enclosure 3, in No. 8.

Sir,

India Office, 20 February, 1868.

I AM directed by the Secretary of State for India to acknowledge the receipt of your letter of the 11th instant, No. 2789, and to acquaint you, in reply, that, after giving the subject his careful consideration in Council, he has come to the conclusion that it is not now for the interest of the Indus Flotilla to become possessed, on any terms, of the vessels and other property on the Indus of the Oriental Inland Steam Navigation Company. The Government of Bombay has been informed accordingly.

W. P. Andrew, Esq.

I am, &c.
(signed) *Clinton.*

EAST INDIA (ORIENTAL STEAM
COMPANY).

COPY of CORRESPONDENCE between the Secretary of State for India and the Bombay Government, relative to the Proposed PURCHASE, by the INDUS FLOTILLA, of the STEAMERS belonging to the ORIENTAL STEAM COMPANY.

(*Lord William Hay.*)

Ordered, by The House of Commons, to be Printed,
14 July 1868.

RETURN to an Address of the Honourable The House of Commons,
dated 18 March 1868;—for,

“COPY of a DESPATCH from the Registrar of the High Court of Judicature at *Fort William* in *Bengal* to the Secretary to the Government of *India*, Foreign Department, No. 1087, dated Calcutta, the 5th day of April 1867, in reference to the CLAIMS of the Representatives of *Monohwr Doss* and *Dwarcah Doss* against the late Native Government of *Oudh*.”

India Office, }
25 March 1868. }

H. L. ANDERSON,
Secretary Judicial and Legislative Department.

From *L. R. Tottenham*, Esq., Registrar of the High Court of Judicature at *Fort William*, in *Bengal*, to the Secretary to the Government of *India*, Foreign Department (No. 1087); dated Calcutta, 5 April 1867.

I AM directed to forward herewith, for the purpose of being laid before His Excellency the Governor General in Council, a letter from the Commissioners appointed for the purpose of inquiring into, and reporting on, the *Oudh* claims, together with their Report on the claim of Mr. Prendergast on behalf of the representatives of certain bankers called *Monohur Doss* and *Dwarka Doss*.

Right Honourable Sir and Honourable Sirs,

WE, the Commissioners appointed for the purpose of inquiring into, and reporting on, certain claims preferred against the late native government of *Oudh*, set forth and described in certain papers furnished to the Government of *India*, with the Despatch of the Secretary of State, in the Judicial Department, No. 78, dated the 24th of August 1863, beg to submit to your Excellency in Council our Report on the claim described as the claim of Mr. Prendergast, professing to be a claim on behalf of the representatives of certain bankers called *Monohur Doss* and *Dwarka Doss*.

It will be seen that very great delay has taken place in bringing this case to a hearing. By notification in the “*Gazette*,” dated the 9th of February 1864, Tuesday, the 16th of February 1864, was appointed for the purpose of entering on the inquiry, and claimants were warned to appear. For reasons mentioned in our report, it was not until the 22nd of November following that the issues were fixed. An order was then made that a Commission should issue for the examination of witnesses in *England*. It was the duty of the claimant to prepare a draft of the Commission; delay took place in the preparation of the Commission, and it was not ready for transmission to *England* before the 30th of May 1865. The witnesses were examined, and the depositions, with the exhibits, returned to this country at the end of July or the beginning of August 1866. A day was then appointed for the hearing, when it appeared that a number of printed papers which had been produced and examined in *England*, and which Mr. Lawford, as solicitor for the Secretary of State, had agreed to admit, had not been sent out from *England*, and that there were no copies of those papers in this country. After some adjournments it was finally arranged that a day for the hearing should be fixed shortly after the arrival of the first regular Calcutta mail in February of the present year. A further short adjournment took place to suit the convenience of Mr. Justice Campbell, who was engaged as Commissioner in inquiring into matters connected with the famine in *Orissa*. With the report now presented our labours conclude.

We have, &c.
(signed) *John P. Norman.*
C. Trevor.
G. Campbell.

Calcutta, 5 April A.D. 1867.

CLAIM preferred by Mr. *Prendergast*.

The Claim called the Calcutta Bankers' Claim, or the Claim of Monohur Doss, and Dwarka Doss, and Seetul Bohoo.

SEVERAL claimants have appeared at different times before the Commissioners alleging themselves to be interested in this claim.

Mr. Wellesley Bowes Prendergast, as agent for the representatives of Monohur Doss by his attorney, Mr. St. Barbe Sladen, appears to have been in correspondence with the Secretary of State for India in relation to this claim in August 1863, and afterwards in November 1863 himself addressed a letter to the Governor General of India in Council, asking for time to prepare his case in consequence of the absence of his legal adviser, Mr. Pauncefote, in China.

At the first meeting of the Commissioners, on the 16th of February 1864, Mr. Carruthers appeared for Mr. Prendergast, and stated that the original papers which he required in order to support the claim were in China, having been sent by accident to Mr. Pauncefote.

The Commissioners ordered that the claimant should put in a written statement, and annex copies of all documents on which the claim was based, and if the documents were in any other language than English, authenticated copies of the originals, with English translations annexed, were to be put in within 10 days. It was also arranged that the Advocate General on behalf of the Secretary of State, should put in a written statement detailing the grounds of resistance to the claim, and that copies of the written statements should be exchanged between the parties.

On the second day of sitting, 1st March 1863, Mr. Newmarch, instructed by Mr. Carruthers, appeared for Mr. Prendergast, and on an affidavit sworn by Mr. Carruthers and one Parbutty Churn Nundy, who described himself as a Mooktear, and stated himself to be the duly authorised agent of Baboo Horruck Chund, now of Benares, the sole representative of Monohur Doss, one of the original claimants, and also of Baboo Joynarain Doss, Juggonauth Doss, and Bany Sahoi, all of Benares, the sole representatives of Dwarka Doss, the other original claimant, setting out the facts, applied for further time to file a written statement. The Commissioners allowed further time, viz., till the 1st of May, for filing the written statement. The Commission was then adjourned.

On the 1st of July 1864 Mr. Carruthers stated that he was not claiming on behalf of Mr. Prendergast. The Advocate General objected that he must either abandon the claim which was put forward on behalf of Mr. Prendergast, or give satisfactory proof that he was duly authorised by the representatives of the late Mr. Prendergast to assent to the claims in the form then made. Mr. Carruthers asked for time to communicate with the representatives of Mr. Prendergast in England.

Mr. Prendergast has put in no written statement, and has not since appeared personally or by any agent before the Commissioners. So far as regards Mr. Prendergast's claim, we may observe that the 37 Geo. 3, c. 142, s. 28, contains the following provision:—

“Nor shall any British subject by himself or by any other person, either directly or indirectly, for his own use and benefit, take, receive, hold, enjoy, or be concerned in any bond, note, or other security or assignment granted, or to be granted, by any native prince in India after the 1st of December then next, for the loan or for the repayment of money or other valuable thing without the consent and approbation of the Court of Directors of the East India Company, or the consent and approbation of the Governor in Council of one of the said Company's Governments in India first had and obtained in writing, and any person doing, acting, or transacting, or being concerned in any actings, doings, and transactions, contrary to this Act shall be deemed and taken to be guilty of a misdemeanor at law, and shall and may be proceeded against and punished as such by virtue of this Act before any court of competent jurisdiction; and all bonds, notes, assignments, or securities for money of what kind or nature soever taken, held, or enjoyed either directly or indirectly for the use and benefit of any

British

British subject contrary to the true intent and meaning of this Act shall be, and the same are hereby declared to be, null and void to all intents and purposes." How far this applies to Mr. Prendergast's claim, we think we need not at present examine.

Doyal Kisto Doss, alleging himself to be the representative of Budinath Doss, appeared before the Commissioners on the 16th of February 1864. As his claim was not one of those mentioned in the original Commission, the Commissioners refused to hear him. He then stated that his claim was identical with, or a part of, that put forward by Mr. Prendergast, whose claim was named in the Commission, and on his application the Commissioners directed that notice should be given to him when the claim of Mr. Prendergast should be investigated in order to enable him to be present. Notice was subsequently given, but neither Doyal Kisto Doss nor any one representing him ever again appeared before the Commissioners.

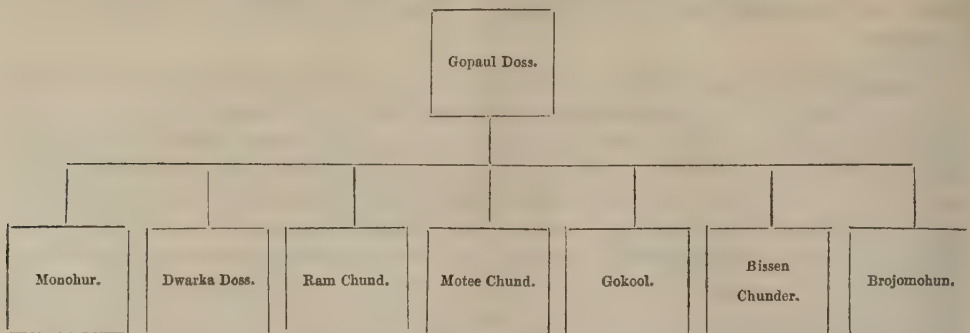
It is supposed that Doyal Kisto Doss is dead.

Hurruck Chund.—On the 30th of April 1864, Messrs. Dallas and Carruthers transmitted to the Commissioners a written statement on behalf of Hurruck Chund Doss and Joynarain Doss, as the descendants of the original claimants, Monohur Doss and Dwarka Doss, verified by Parbutty Churn Nundy, describing himself as of Sham Bazar, in the town of Calcutta, the duly constituted agent of Hurruck Chund Doss and Joynarain Doss. The President of the Commission declined to receive this written statement upon the ground that the Commissioners were only to inquire as to the claims preferred against the late Native Government of Oudh by Mr. Prendergast, his heirs or representatives. A short time after this, the Honourable A. A. Roberts, C.B., C.S.I., having returned to his appointment in the Punjab, and John Walter Sherer, Esq., C.S.I., having returned to his appointment in the North Western Provinces, it became necessary to appoint fresh Commissioners. The President of the Commission brought to the notice of the Government that claims have been brought forward by persons claiming to be members of the Doss family, and enclosed a letter from Mr. Carruthers alleging that Mr. Prendergast was merely an agent for the Doss family, whose claim had become known in England as Prendergast's claim, and stating that it was so described in the Commission. The President requested the instructions of the Government as to whether or not the claims of these parties were to be inquired into, and received a reply from the Foreign Secretary informing him that the name of the Doss family had been added in the fresh notification without exclusion of Mr. Prendergast's name, so that the investigation of these conflicting claims would be left entirely in the discretion of the Commissioners.

On the 29th of June, the Honourable Mr. Justice Trevor and the Honourable Mr. Justice Campbell were appointed as Commissioners in the place of the Honourable A. A. Roberts, C.B., and Mr. J. W. Sherer, under the 3rd section of the Act, and in pursuance of section 4, a notification was published in the "Gazette of India," to the effect that the Commissioners would on the 11th day of July proceed to investigate (*inter alia*) the claims of Monohur Doss or Seetul Bohoo, or the Doss family, and of Mr. Prendergast. On the 11th of July, Mr. Carruthers tendered the written statement which had been previously rejected, and it was received. The Commissioners called on Mr. Carruthers to produce vakalutnamahs from the representatives of Monohur Doss and Dwarka Doss to show that he really had authority to appear and represent them. Mr. Carruthers asked for time to enable him to do so; but down to the present time he has never put in a vakalutnamah, or produced any written authority authorising him to appear for Hurruck Chund. It is not denied that Hurruck Chund is still alive and residing at Benares, but he has not appeared before the Commissioners either personally or by any agent empowered to represent him in the mode in which such persons are invariably authorised to appear in the Courts of this country.

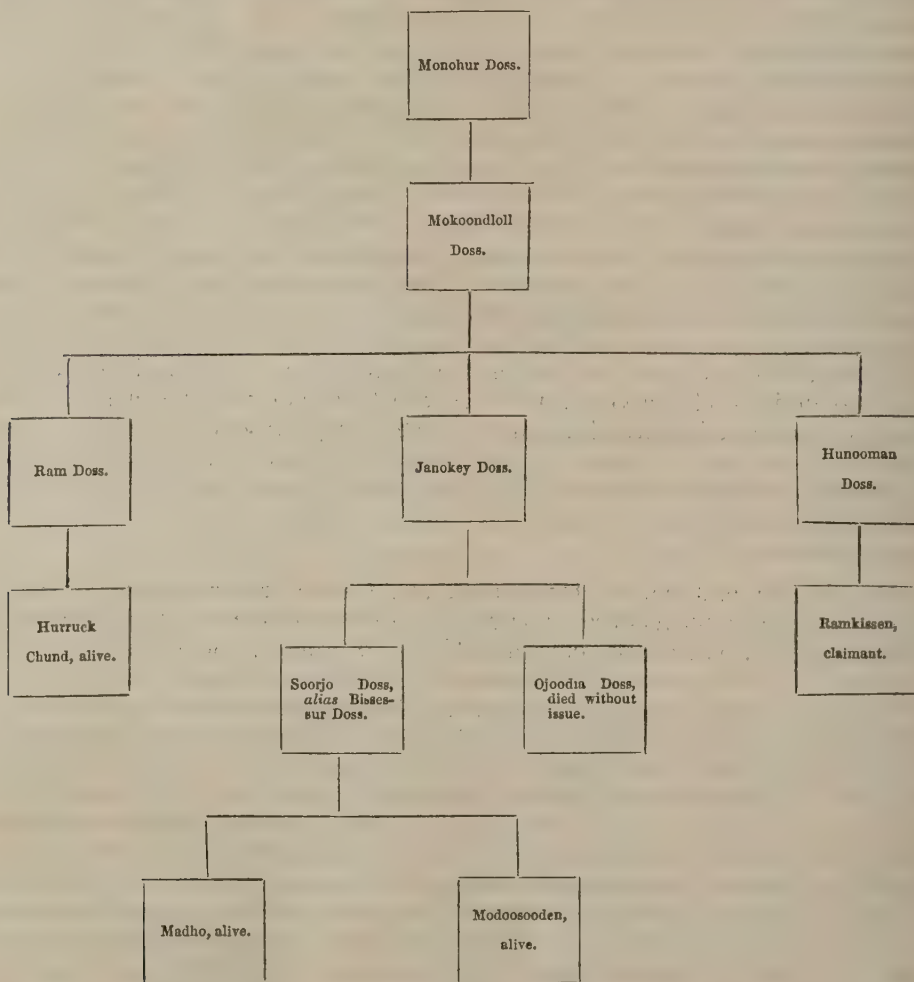
Ramkissen Doss claims as a representative of the family of Monohur Doss. Mr. Carruthers put in a warrant authorising him to prosecute this person's claim, dated the 9th of May 1866.

It was stated in evidence by Joynarain Doss that Monohur Doss and Dwarka Doss were the sons of Gopaul; who had seven sons, as follows :



He said he had heard this from Baboo Ram Chund and Baboo Motee Chund ; he had seen these two brothers, not the other five. The businesses of Monohur Doss and Dwarka Doss were always separate.

The alleged descent of Ramkissen from, and claim under, Monohur Doss is exhibited in the accompanying tree, which was spoken to by Joynarain in his evidence :—



The bonds produced, purporting to be made in favour of Baboo Monohur Doss are as follows :—

	Rs.
10th February 1795.—Payable out of the territories of the Sircar, with interest at 2 per cent. per month	2,10,000
16th April 1793.—Payable out of the territories of the Sircar, with interest at 2 per cent. per month	1,02,000

In

In the written statement on the part of Hurruck Chund and Joynarain Doss, originally tendered on the 29th of April 1864, it is stated that Hurruck Chund claims to be entitled by family arrangements and partition to the whole interest of Monohur Doss in the subject-matter of this claim; but his title as sole claimant may be disputed by the other descendants of Monohur Doss. At the hearing on the 26th of February 1867 Mr. Paul, who, instructed by Mr. Carruthers, appeared on behalf of the claimant, Ramkissen Doss, put in as part of his case a deed poll, dated the 24th of February 1825, executed by Ram Doss as the grandson and heir and legal personal representative of Baboo Monohur Doss, which contained a recital that Monohur Doss had died at Benares, leaving Muchoonloll Doss, who is apparently identical with Mokoondloll, his only son; that Muchoonloll Doss had died on the 26th of September 1820, leaving three sons, viz., himself, Ram Doss, Baboo Janokey Doss, and Baboo Hunooman Doss, heirs of the property of Monohur Doss and Muchoonloll Doss; that on a division of the property being made the sums which Maharajah Tickait Roy had agreed to pay out of the revenues of the territories of the Vizier, and the bonds, deeds, and writings securing the same were absolutely assigned by Baboo Janokey Doss and Baboo Hunooman Doss to him, Baboo Ram Doss, who was then solely interested in the same; and by that instrument Baboo Ram Doss gave to Mr. Michael George Prendergast full power and authority, if he should see fit, by any deed or writing, or by his last will, to appoint any person as attorney for him, the said Ram Doss. A deed poll of the 7th of March 1835, executed by Baboo Ram Doss, and produced by Mr. Paul as part of his case, contains similar recitals.

The Commissioners pointed out that the recitals in these deeds went to show that the rights of Monohur Doss, whatever they were, are now vested in the heirs of Ram Doss, and that Ramkissen Doss, who appears to be the son of Hunooman Doss, had no interest whatever in the claim.

Mr. Paul admitted that he was not in a position to answer the objection.

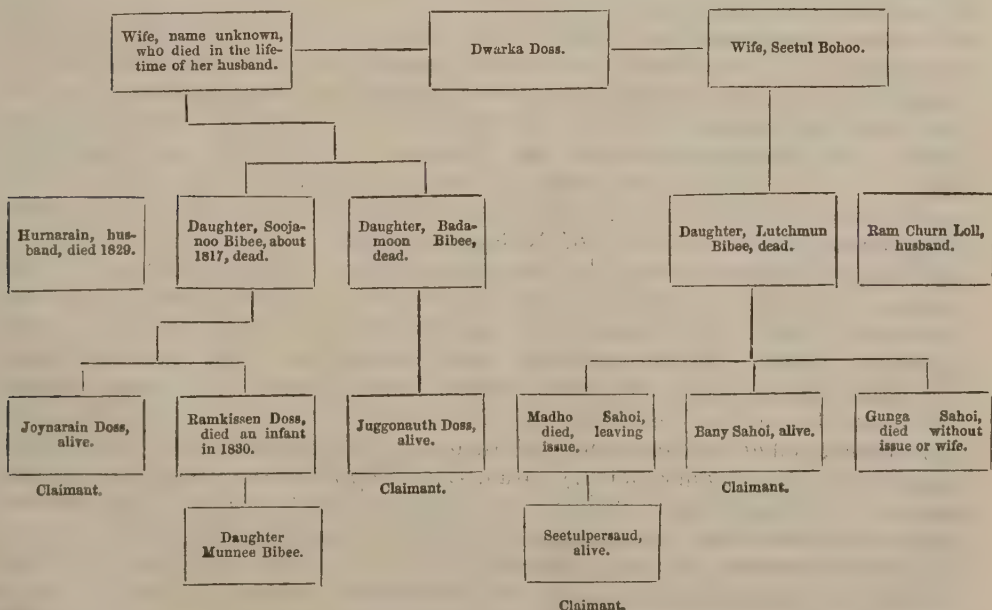
Juggonauth Doss and Joynarain Doss.—Warrants in writing similar in form to those in use in the High Court in its ordinary original civil jurisdiction, bearing date the 19th of November 1864, were put in authorising Mr. Carruthers to appear and prosecute these claims.

Seetulpersaud.—The warrant bears date the 10th of May 1866.

Bany Sahoi.—The warrant is dated the 14th of June 1866.

The position of these parties as heirs of Dwarka Doss is exhibited in the following

PEDIGREE.



In the "Gazette of India" of the 15th of October 1864 public notice was given that the Commissioners would meet in a public sitting at the High Court, Appellate Jurisdiction, on the 21st day of November, and sit from day to day for the purpose of hearing and adjudicating upon the claims of the several parties. On the 22nd of November Mr. Paul appeared as advocate for Joynarain Doss and the Advocate General for the Crown, when the following issues were fixed :—

1. Whether the claimants are entitled as representatives of Monohur Doss or Dwarka Doss.

2. Whether the documents on which the claim is based were executed by the several persons by whom the same purport to have been executed, and so as to bind Asoph-ood-Dowlah, the Nawab Vizier of Oudh.

3. Whether there was any, and what, consideration for the signing of the documents.

4. Whether the amount mentioned in the documents, or any part thereof, was due from the Nawab Vizier, Asoph-ood-Dowlah, at the time of his death.

5. Whether such debt must be presumed to have been satisfied.

6. Whether the debt therein mentioned was ever a charge on the revenues of the kingdom of Oudh.

7. Whether by any repudiation by any succeeding Nawab before the annexation those debts ceased to be a charge on the revenues of the kingdom of Oudh.

8. Whether the British Government is now liable to pay the money mentioned in the bonds and in the memorandum.

As to the first issue :—

The first issue is whether the claimants are the representatives of Dwarka Doss, Motee Chund.

Joynarain Doss, examined on the 26th of February 1867, said:—I am a Mahajun ; I reside at Benares ; I knew Ram Churn Loll, the husband of the sister of my mother. Lutchman Bibee was the daughter of Dwarka Doss. I never saw Dwarka Doss. Ram Churn Loll is dead. My father was Hurnarain Roy ; mother, Soojanoo Bibee. I have no brother ; I had one, he is dead. His name was Ramkissen ; his wife is dead ; he had a daughter, Munnee Bibee. Ramkissen used to remain with us ; I am his heir. We were joint in food and estate at Benares. My age is about 51½. I never saw my mother's mother. My mother is dead about 50 years ago ; I was about 14 or 15 months old when she died ; my father, Hurnarain, died in 1829. The name of my mother's father was Baboo Dwarka Doss. I have heard that from my brother, Baboo Ramkissen, and my grandmother, my father's mother ; my brother died at the age of 28 or 29 in the year 1830, in Calcutta. He was my elder brother, 11 or 12 years older than myself. My father's step-mother was Bussunto ; I never saw my father's own mother. I know Juggonauth Doss. I know Bany Sahoi ; Bany Sahoi is the son of my mother's sister. Ramkissen and I were children of the same mother ; Juggonauth Doss was the son of Badamoon Bibee ; I know that of my own knowledge ; I have seen her ; she was the daughter of Dwarka Doss. I know it from my brother. Lutchmun Bibee was my aunt. Bany Sahoi's mother was Lutchmun Bibee ; Ram Churn Loll was the father of Bany Sahoi. I knew Lutchmun Bibee and her husband, Ram Churn Loll ; they are both dead. Lutchmun Bibee's father was Baboo Dwarka Doss : I heard it from many persons. We brought a suit for one-third share of his property against Madho Sahoi and Bany Sahoi, and got a decree here, in Calcutta. (He produced a copy of a Persian decree of the late Sudder Court.) Ram Churn Loll was the Mooktear ; he died about 25 or 26 years ago. When Baboo Dwarka Doss's widow, Seetul Bohoo, was alive he transacted her business. He used to manage all the 52 kotees and all the law business ; he used to manage all the lawsuits and cases for Seetul Bohoo. Madho Sahoi had a son, Seetulpersaud. Gunga, the third son of Lutchmun, died without issue ; he was never married. Ram Churn Loll carried on the kotees for Seetul Bohoo in the name of Dwarka Doss. Dwarka Doss's kotee

kotee was closed 40 or 45 years ago, beyond my recollection. The 52 kotees were closed shortly after Baboo Dwarka Doss's death; the other was in Benares. After Seetul Bohoo's death that business was closed; the Benares kotee was the Sudder Kotee. The books were in the charge of Baboo Madho Sahoi; but he was such a *kumbukht* that he sold them as waste paper and ate the proceeds. I have no papers connected with this claim; my suit was then pending. Where had I any papers? In the Lucknow house Motee Chund had no interest, but his name was used.

The decree produced by Joynarain shows that on the 19th of June 1830, Mr. M. H. Turnbull, a Judge of the Sudder Court, affirmed a decision of the Provincial Court at Benares in a suit by Ramkissen and Joynarain, infants, represented by Hurnarain, their father, as their Mooktear, for 25,00,000 rupees, being one-third of the estate of Dwarka Doss, which they claimed as the sons of his daughter, Soojanoo Bibee, alleging that Juggonauth was entitled to one-third as heir of another daughter, Mussumat Bibee Badamoon; that Baboos Madho Sahoi and Bany Sahoi, infants, represented by their Mooktear, Ram Churn Loll, were entitled as sons of Lutchmun Bibee, the third daughter, only to one-third instead of the whole estate of Dwarka Doss, as claimed by the defendants. Large as the amount in dispute would seem to have been, the respondents did not appear on the hearing of the appeal, although, as observed by the judge, a receipt was endorsed on the notice. Perhaps this may admit of explanation if Ramkissen, who survived his father, Hurnarain, was then dead. It appears from the recitals in this decree that the decree of the Provincial Court was passed without specifying the amount under claim.

The suit appears to have been instituted in 1816, and for some reason or other languished until December 1826. The answer, as set out in the decree produced, is a virtual admission of the title of the plaintiffs in that cause.

On the 24th of February 1825, Ram Churn Loll executed a power of attorney in favour of Mr. M. G. Prendergast, reciting that Seetul Bohoo, the sole widow of Dwarka Doss, had died, having by will devised all moveable and immoveable property, as well that possessed by Dwarka Doss as by herself, to Madho Sahoi and Bany Sahoi, the children of her daughter, Lutchmun; that under the said deed of gift, and also as heirs and legal personal representatives of Dwarka Doss and Seetul Bohoo, Madho Sahoi and Bany Sahoi were entitled to all the estates of Dwarka Doss, and that Madho Sahoi and Bany Sahoi were infants under the age of 16 years. Ram Churn Loll, as manager, executor, and trustee of the estates of Dwarka Doss, and as guardian of the infants, appointed Mr. M. G. Prendergast as his attorney, &c. The document is witnessed by Robert North Collie Hamilton, Esq., Officiating Judge and Magistrate of Benares, who certified upon the deed that he knew Ram Churn Loll, the Mooktear or Manager of the kotee formerly of Dwarka Doss; and that he, Ram Churn Loll, transacted all business in courts as such.

On the 25th of May 1827, certain articles of agreement were executed by Ram Churn Loll in the presence of, and attested by Mr. R. N. C. Hamilton, by which Ram Churn Loll agreed to pay to Mr. M. G. Prendergast one full third share of all such sums as should be recovered of the debts claimed from the Native Government of Oudh.

It is not unworthy of remark that, notwithstanding the decree of December 1826, at the time of the execution of this agreement neither Baboo Ram Churn Loll, Mr. Hamilton, nor Mr. Prendergast's agent, should have paid any attention to the interests of Joynarain, Ramkissen, and Juggonauth, the other alleged heirs of Baboo Dwarka Doss.

Joynarain was not cross-examined as to the family history. If his evidence is to be relied upon—and we do not see any reason to discredit it—all the heirs of Dwarka Doss, except, perhaps, Munnee Bibee, were represented before the Commissioner.

None of these parties appear to be in possession of a single scrap of paper or account relating to the present claim.

Before pronouncing that the present claimants represent Dwarka Doss, Motee Chund, or in other words, that the interest of Dwarka Doss, Motee Chund in the money claimed is now vested in them, we think that each of the parties should be called on to come in and support his claim personally; and that advertisements should be issued calling on the heirs of Motee Chund as well as of Dwarka Doss to come in and support any claim they may have, and an inquiry

might then take place as to whether the decree of the Provincial Court was *bonâ fide* or not, and whether it was executed or acted on in any way. Had we not considered that the claim was unsustainable on other grounds, we should have instituted these further inquiries ourselves; but, for reasons which will afterwards appear, we have thought it unnecessary to put the parties to further expense.

Before going further we desire to observe that while Mr. Prendergast, Mr. St. Barbe Sladen, and Mr. W. B. Prendergast, are pressing these claims actively enough on the Home Government, it is very remarkable that their supposed clients are not forthcoming when looked for in this country.

Of the descendants of Monohur Doss, only one has come forward to put in his claim before the Commissioners, though Hurruck Chund is stated to be alive and a banker in good circumstances at Benares.

Ramkissen Doss, the son of Hunooman Doss, who was grandson of Monohur Doss, appears to have been persuaded by some one or other to put in a warrant authorising Mr. Carruthers to appear for him on the 9th of May 1866. But, on his own showing, it was at once apparent that he had no title whatever.

Of the descendants of Dwarka Doss, Seetulpersaud and Bany Sahoi, who represent the parties in whose behalf, as heirs of Dwarka Doss, the claim has been pressed on the Government by Mr. Prendergast from 1809 down to the end of 1863, never appeared in person before the Commissioners, and, apparently, were not persuaded to authorise the parties conducting the case to prosecute any claim on their behalf till the middle of the year 1866.

Joynarain and Juggonauth, who are represented to be descendants of the daughters of Dwarka Doss by another wife, not Seetul Bohoo, appeared for the first time as claimants after this Commission opened. It is by no means clear how they came into communication with Mr. Prendergast or Mr. Sladen: they were certainly not Mr. Prendergast's original clients. It does not appear that Mr. Prendergast was ever employed as agent for them or their mothers. If Mr. Prendergast was really merely prosecuting the claim as an agent, to be paid in a particular manner, it is singular that he should have been allowed to keep possession of all the securities and of both the duplicate copies of the several agreements with Ram Doss and Ram Churn Loll.

As to the second, third, fourth, and fifth issues:—

By the written statement put in as on behalf of Hurruck Chund and Joynarain Doss, it is stated that the claimants seek to have it declared that the representatives of Monohur Doss and Dwarka Doss are entitled to have paid to them, by the Secretary of State in Council, out of the public revenues of India, the several shares to which they may be respectively entitled, the amount of principal and interest due on the several memoranda, tunkahs, or bonds, as follows:—

In favour of Dwarka Doss, Motee Chund, and other Mahajuns.

19 March 1794.

Memorandum under seals purporting to be the seals of Tickait Roy and

Hossein Reza, with interest at 2 rupees per month - - - - - Rs. 2,70,000

In favour of Dwarka Doss, Motee Chund.

10 April 1794.

Bond under the seals of Tickait Roy and Hossein Reza, payable out of the revenues of the territories of the Sircar, with interest at 2 per cent. per month - - - - -

Rs. 1,21,200

6 February 1795.

Memorandum signed by Hoolas Roy—borrowed for the expenses of the

Dooab, with interest at 2½ per cent. per month - - - - - Rs. 3,85,000

In favour of Biehmoorut Shirsohoy Patuck.

No date.—Seal illegible - - - - - Rs. 37,500

15 May 1795.

Order in favour of Baboo Ramsoonder, with interest at 3 rupees per month - - - - -

Rs. 33,000

None of the petitioners are shown to have any interest whatever in these two last documents. Baboo Ramsoonder is entered separately as a creditor and claimant for 33,000 rupees in Mr. Cherry's list; he is not before us in any way.

We have only to deal with the three instruments first above mentioned.

Documents purporting to be the originals in Persian of the several bonds and memoranda

memoranda above referred to were produced before us by Mr. Augustus Stewart in seven silken bags. He stated that these bags, together with two powers of attorney, one executed by Baboo Ram Doss to Mr. Prendergast, and another by Baboo Ram Churn Loll to Mr. Prendergast, and four agreements purporting to be between the same parties, had been forwarded to him by Messrs. Thompson, Pickering, and Styan, solicitors of Lincoln's-Inn-Fields, for the purpose of being produced before the commissioners. He said his instructions were to produce the bonds and papers, but not to deliver them up. These are the documents referred to in the evidence of Mr. Hopkinson.

Mr. Thompson, examined as a witness by commission in England, stated that his firm were solicitors for the late Percy Clinton Sydney, Viscount Strangford, and also for the present Viscount Strangford; that there is no legal personal representative of the late Viscount Strangford.

Mr. Young, also examined by commission in England, proved that his firm are the solicitors of the surviving executors of Sir Gore Ouseley, who died in 1844, and that they had acted for the executors ever since the date of Sir G. Ouseley's decease; that amongst the papers of Sir Gore Ouseley was found an agreement dated the 7th of March 1835. This agreement, made between Ram Doss, described as grandson and heir and legal representative of Monohur Doss, of the one part, and Rosetta Prendergast, widow of Michael George Prendergast, of the other part, recites certain articles of agreement, dated the 6th of January 1809, between Baboo Ram Doss and Mr. G. Prendergast reciting that Narendro Maharajah Tickait Roy, by certain deeds or instruments under his hand and seal in the Persian language and character, had acknowledged that he had borrowed monies for the use of the Government of the Nawab of Oudh; that Monohur Doss had been informed that these sums were likely to be received in England; that by a power of attorney, dated the 15th of May then last, he had appointed Mr. M. G. Prendergast as his attorney; that he had consented to allow to Mr. M. G. Prendergast one-fourth of all sums of money which should happen to be secured, realised, or recovered of these debts by means of the exertions, advice, or authority of the said M. G. Prendergast over and above the sum of (Sicca) Rs. 6,784. 11. 8, which had been lodged by Monohur Doss with Messrs. Fairlie, Gilmore and Company; and recites further that by another agreement, bearing date in 1826, setting out the above-mentioned agreement, stating that Prendergast had proceeded at once to act under the power of attorney, and during a period of 17 years had unceasingly exerted himself to enforce payment of the debt; that he had instituted proceedings in Chancery, presented memorials to the Court of Directors, and commenced long and expensive inquiries before a Committee of the House of Commons; that at the time of making the first-mentioned agreement it was calculated that Mr. Prendergast would be enabled to obtain payment on security within the period of five years; that the proportion of one-fourth of such debts, when so recovered, was upon that calculation estimated and considered a fair and reasonable compensation for the said Mr. M. G. Prendergast. It was witnessed that Baboo Ram Doss, in lieu of the said one-fourth part secured to be paid to him, agreed to pay, allow, or secure to him one-third part, and reciting that Mr. G. Prendergast had continued to urge the justice of the claim; and that the Board of Control, being satisfied of the justice of the same, called on the Honourable East India Company to send out a despatch to India for a settlement of the said claim, &c.

That Mr. G. Prendergast died on the 16th of February 1834, intestate, leaving his widow, Rosetta Prendergast, and four children, all then minors, him surviving. And further reciting that Rosetta Prendergast, with the aid of her friends, the Right Honourable Percy Clinton Sydney, Viscount Strangford, Sir G. Ouseley, and James Norris, was about to prosecute the claim, and reciting that Baboo Ram Doss had at the request of Rosetta Prendergast executed a deed poll appointing her with her friends Lord Strangford, Sir G. Ouseley, and James Norris, attorneys, and had agreed to allow in addition to the one-third share to Mr. M. G. Prendergast one full 32nd share to Rosetta Prendergast. The said Ram Doss did covenant and agree to allow, in addition to the one-third share secured to Mr. G. Prendergast one *other part or share* of all sums of money to be recovered, or received, or secured, &c., and Rosetta Prendergast covenanted to use her best endeavours to procure justice for Ram Doss.

By deed poll bearing the same date as this agreement, Baboo Ram Doss

appointed Rosetta Prendergast, Percy Lord Strangford, Sir G. Ouseley, and James Norris, his attorneys, to prosecute his claim.

The deed poll and articles of agreement, dated the 26th of June 1826, executed by Ram Doss, mentioned in the recital in this deed, have been produced before us.

The representatives of Dwarka Doss do not appear to have executed any document empowering Rosetta Prendergast, Lord Strangford, Sir G. Ouseley, and Mr. Norris to act as their attorneys.

But Mr. Stewart produced before us two deeds, purporting to be duplicate copies of articles of agreement, dated the 26th of June 1826, between Baboo Ram Churn Loll, describing himself as mooktear, manager, executor, and trustee under the Will of Seetul Bohoo, late of Benares, described as having been the widow, heiress, and legal personal representative of Baboo Dwarka Doss.

After reciting that by an agreement dated the 6th of January 1809, under the hands and seals of Seetul Bohoo and M. G. Prendergast, reciting that Dwarka Doss had died some years before without leaving any male children, and leaving Seetul Bohoo his widow, whereby she became his sole heiress, and reciting that Dwarka Doss carried on business as a banker under the name of Dwarka Doss, Motee Chund; that Dwarka Doss had lent large sums of money to the ministers and for the support of the Government of the Nawab Vizier of Oudh; that Seetul Bohoo had been informed that the debts were likely to be recovered in Great Britain, and had appointed Mr. M. G. Prendergast her attorney, and consented to allow him one-fourth part or share of all sums which should happen to be recovered or secured of the said debts by means of his exertions, in addition to Rs. 12,315. 4. 4 deposited with Fairlie, Gilmore and Company by the said Seetul Bohoo; that Mr. M. G. Prendergast had acted under the power; that at the time of entering into the agreement it was considered that he would be enabled to obtain payment within five years. In consequence of his great exertions, and in order to induce him to continue the same, Ram Churn Loll agreed to pay to Mr. M. G. Prendergast one-third, instead of one-fourth of the monies to be recovered.

Mr. Charles Hopkinson, a member of the firm of Hopkinson and Company, Bankers, of Regent Street, London, examined by commission in London, produced a sealed packet containing the seven bonds or memoranda in seven silken bags; a paper purporting to be a copy of articles of agreement between Baboo Monohur Doss, residing at Benares, banker, on the one part, and Mr. M. G. Prendergast on the other, dated the 6th of January, 1809; the power of attorney from Baboo Ram Churn Loll to Prendergast, dated the 24th of February 1826; a power of attorney from Baboo Ram Doss to Prendergast, dated the 24th of February 1825; two papers in duplicate purporting to be articles of agreement between Baboo Ram Doss and Mr. M. G. Prendergast, dated 26th June, 1826; two other papers purporting to be articles of agreement in duplicate between Baboo Ram Churn Loll and Prendergast, bearing date the 20th of June 1826. He stated that this packet was deposited with the bank for safe custody on the 3rd of March 1834, by Mr. Thomas Beatty, and that to the best of his knowledge it had never been out of the custody of the bank since it was first deposited. He said that his firm had no pecuniary claim or lien on the parcel or its contents; that they received an order purporting to be signed by Mr. Shawe Thomas Beatty and Ambrose Humphreys, dated the 19th of March 1834, requesting that they would transfer the packet deposited with the bank into the names of Sir G. Ouseley, Lord Strangford, James Norris, and Thomas Beatty; that they subsequently received a document bearing date the 22nd of May 1834, purporting to be signed by Lord Strangford, Sir G. Ouseley, and James Norris, requesting them to permit Mr. Beatty to open the packet and to add other documents, and then relodge the whole in their names for safe keeping. He added that Mr. Beatty was an intimate friend of Mr. M. G. Prendergast, and that he died 15 or 20 years ago. The packet, as produced, appears to have borne the following endorsement:—
 “Papers relating to the claim of the Calcutta and Benares bankers in deposit with Messrs. Hopkinson & Co., for the Right Honourable Lord Strangford, the Right Honourable Sir G. Ouseley, and James Norris, subject to delivery only on the joint order of the said parties, but open to the inspection of any one of them whenever required. London, the 24th May 1834.—(Signed) *G. Ouseley. James Norris.*” On the reverse side of the parcel was the following memorandum:

random:—"Memorandum opened by Lord Strangford, the 10th June 1851.—*C. S. K.*" That memorandum was proved to be in the handwriting of Mr. Carey Seymour Knyvett, who was in 1851 a partner in the firm of Messrs. Hopkinson, but is since dead. As to the previous history of the silken bags and their contents, Mr. Wellesley Bowes Prendergast, whose evidence was taken by commission in London, deposed:—"I was born in May 1816. I was 18 years of age when my father, Mr. M. G. Prendergast, died in 1834. I knew Mr. Beatty well: he was an intimate friend of my father and his family; I always looked upon him as a kind of guardian. I was told by Mr. Beatty, on the day when he deposited the packet with Messrs. Hopkinson, that the deposit had been made. I saw certain bags like those now produced in my mother's jewel box prior to my father's decease. I never opened the bags. I believe the bags now produced to be the same bags."

Mr. Charles Milner Ricketts, examined by commission in London, said:—"I was born on the 17th April 1776. I entered the Civil Service in India in 1791, and almost immediately went out to India. I remained about 27 years in India. During that time, amongst other offices I held were those of Secretary to the Government for the Public Department and Financial and the Chief Secretary to the Government, and also Principal Private Secretary to the Governor General, Lord Moira. I was also a Member of the Supreme Council in the Bengal establishment. Whilst in India I was acquainted with Monohur Doss, and also Dwarka Doss, who were bankers at Calcutta and Benares. I also knew Mr. Michael George Prendergast, merchant in Calcutta and Oudh; he left India in 1808 or 1809. Mr. M. G. Prendergast was agent for the above-named bankers in prosecuting their claims against the Nawab of Oudh. They entrusted me with certain documents, to be transmitted by me to Mr. M. G. Prendergast in England, and I transmitted them through the captain of a ship to him. I believe that the seven documents enclosed in seven small silken bags now produced are the seven documents which I received from Monohur Doss and Dwarka Doss, and which were transmitted by me to Mr. Prendergast."

Being cross-examined, he said:—"I identify these documents, because Mr. William Coates Blaquiére, Translator and Interpreter to the Supreme Court, put a number in each bag, and also certain other figures, which I now recognize. I saw a document put into each bag. I had all that time a slight general knowledge of the Persian language. From the appearance of the documents, I believe them to be the same documents that were put into the bags in my presence." (*Examination in chief proceeded with.*)—"I had copies and translation of the aforesaid documents made by W. C. Blaquiére in triplicate. One set I gave to the bankers, Doss, another set to Mr. Prendergast in England, and the third I gave to Mr. Blaquiére for the purpose of his keeping a record in his office." *Cross-examined.*—"I did not read any of the documents of which I have been speaking at the time they were entrusted to me, and I cannot read these documents now."

By this evidence it appears to us to be proved that these ancient documents have been produced from the custody in which they may reasonably have been expected to have been found; that they are the bonds and memoranda which were handed by Monohur Doss and Dwarka Doss to Mr. Ricketts for transmission to Mr. M. G. Prendergast for the purpose of recovering or enforcing the payment of the monies due upon them; and though Mr. Justice Campbell is not satisfied on this point, the majority of the commissioners see no reason to doubt that they were sealed and executed by the several persons whose names respectively appear thereon.

There is no evidence to show that Hoolas Roy, whose signature appears to the document for 3,80,000 rupees, had authority to bind the Nawab Vizier by the statement of an account.

Apart from this, the bonds and memoranda do not show what was the amount actually due to Baboo Dwarka Doss, because the amount of 2,70,000 rupees mentioned in the bond of the 16th Srabun, 1208 Hijree, is said to be borrowed from Dwarka Doss and other mahajuns. No accounts have been produced to show how much of the amount admitted to be due by this bond is the share of Dwarka Doss.

We are, therefore, compelled to fall back on Mr. Cherry's statement of the accounts of Rajah Tickait Roy. It appears from these accounts that Dwarka

Doss then claimed as due to him Rs. 9,25,056. 7a.; but we have nothing to show how that sum was made up.

We have been unable to identify with certainty the amounts in the bonds and memoranda given to Dwarka Doss, with the items and figures in the account of debts delivered to the resident by Rajah Tickait Roy on the 3rd of November 1795, or with abstract statement delivered by Rajah Tickait Roy on the 3rd November 1795, at the close of his administration. We are, however, led to conclude that the sum of 2,23,128 rupees appearing in the jumma khurch accounts of Rajah Tickait Roy as due to Dwarka Doss on account of money paid for the use of the *Dooab*, in all probability represents the debts mentioned in the paper under the signature of Hoolas Roy as 3,85,000 rupees. At the foot of the memorandum for 3,85,000 rupees is an entry which might lead to the inference that either Rs. 2,30,106. 10 a., or Rs. 67,362. 4 a. 3 p., or both, are brought over from some earlier accounts. Possibly, the account may have been made up with Hoolas Roy to 3,85,000 rupees, by the addition of interest and compound interest.

But at the foot of Mr. Cherry's abstract statement of account is an entry that "the debt appearing by the jumma khurch is the principal due, while the creditors have, many of them, added an interest to the principal."

The abstract statement shows that amongst the sums appearing due by the Vizier's Government, according to the jumma khurch accounts of Rajah Tickait Roy, is a sum under the name of Munsaram, 3,45,999 rupees, with a note that, according to the accounts delivered by the creditors, "this appears to be added to the account of Dwarka Doss (called there Doorkara Doss) Motee Chund."

It therefore appears that Munsaram, who is shown from other papers to have been the agent and Gomashta of Dwarka Doss, Motee Chund, made no claim to this sum of 3,45,999 rupees, but that the house of Dwarka Doss did. The sum of 3,45,999 rupees probably represents the amount admitted by Rajah Tickait Roy to be due to the kotee of Dwarka Doss on the two bonds for 1,21,200 rupees and 2,70,000 rupees respectively. The difference between the entry to the credit of Munsaram, 4,02,132 rupees, in the account of 1795, and the sum 3,45,999 rupees entered as due in the accounts of 1796, may perhaps be explained in this way: There are two items entered on the later accounts separately as due to Munsaram, one on a *tunkah*, or assignment of revenue in his favour on Ismael Beg; the other on a *tunkah* on Azimghur. Probably, if the amount of these two sums due in respect of securities not now in question, together with money which might have been realised on such securities between the 18th of July 1795 and the 14th of April 1796, be deducted from 4,02,132 rupees, the gross amount entered to the credit of Munsaram in the account delivered to the Resident by Rajah Tickait Roy on the 3rd of September 1795, it would leave a balance of something like 3,45,999 rupees, as appearing in the abstract statement of the debts in 1796, as due in respect of the monies paid to and for the use of the Government and the Company's subsidy.

This sum added to Rs. 2,23,128. 0. 6 would make a sum of Rs. 5,69,127. 0. 6 due to the bankers, Dwarka Doss, Motee Chund. These debts are stated to be due from the Vizier's Government. The amount of 4,02,132 rupees is entered as due to Munsaram on the 18th of July 1795 under the head of "sums appropriated to the expenses of Government and to the payment of the company's subsidy," and the amount entered as due to Dwarka Doss, Motee Chund, on that day under the head of "sums appropriated for the use of the *Dooab* under the superintendence of Rajah Hoolas Roy."

We think it, therefore, sufficiently proved that the sum of Rs. 5,69,127. 0. 6 was due from the Nawab Vizier to the house of Dwarka Doss, Motee Chund, for principal, money lent. There is nothing to lead to the inference that any part of this money was paid by the Nawab Vizier between April 1796 and his death in 1797. Indeed, we find it stated in a letter from the Resident at Lucknow to the Governor General, Sir John Shore, dated the 28th of September 1796, that "the native creditors had agreed to admit a deduction of one-half the interest at three per cent., which they had received on former loans, and to accept payment of all the remaining principal sums due to them by instalments in six years, giving up all claim to interest on the bonds now in their possession. The only person amongst them all who has rejected the terms is Munsaram, the agent of the house of Dwarka Doss, son of Gopaul Doss, at Benares, who expressed

expressed his readiness to receive the principal in the same manner as settled with Europeans, but was refused."

There is nothing to show that anything has ever been received by the creditors on account of the bonds in question since the date of that letter.

This disposes of the second, third, fourth, and fifth issues.

As to the sum of 3,45,999 rupees entered under the head of Munsaram, there appears no reason to doubt that the sum was borrowed for the service of the State, and that the debt was contracted in the administration of public affairs. In fact, it is in evidence that this money was appropriated to the expenses of the Government and the payment of the company's subsidy.

The amount of 2,23,128 rupees entered under the name of Dwarka Doss, Motee Chund, appears to have been appropriated for the use of the Dooab, or rather Dawabb, which has been translated—animals, quadrupeds, cattle, or beasts. We are not informed and do not know exactly what is referred to by this word, but in the accounts of Tickait Roy the money is stated to be due from the Government of the Nawab Vizier. We cannot say that the bond on the face of it shows that the money was lent for the purpose of the State.

The seventh issue is, whether by any repudiation of any succeeding Nawab before the annexation the said debts ceased to be a charge on the revenues of the State of Oudh.

This resolves itself into two questions:—first, whether such a repudiation took place in fact; and secondly, what was its effect on the rights and position of the creditor?

When Saadut Ally was at Benares, before he was placed on the Musnud, he appears to have entered into an arrangement that the just debts of Asophood-Dowlah should be discharged.

Shortly after he was placed on the Musnud and had been recognised as Nawab Vizier of Oudh, at the time of the negotiations which led up to the treaty of the 10th of November 1801, he submitted certain articles to the Resident for the consideration of the Governor General in Council. In article 1 he says:—"The payment of the debts of my predecessor, Asoph-ood-Dowlah, is not stipulated for in the existing treaty. I am, moreover, unable to liquidate the debts contracted in the late reign, but this is an affair which will be adjusted between the State and the creditors of the late Nawab, and regarding which the company are in no shape responsible, the treaty being silent on the subject." Lord Wellesley replied that "the object of these articles appears to be under the shelter of the British name to cancel all the public debts of the State of Oudh." The clause objected to by Saadut Ally was not inserted in the treaty, and in referring to this transaction the Court of Directors, in a paper presented to the House of Commons in 1822, express their opinion that they could not interfere in favour of Mr. Prendergast "without imposing upon a friend and ally an obligation from which he had been deliberately relieved."

In January 1816 the Earl of Moira, then Governor General, in a Minute on the claims of Monohur Doss and Seetul Bohoo, remarks that Mr. Strachey, the Resident at Lucknow, might be instructed to take advantage of some favourable opportunity for stating the demand as one which it would be creditable to the justice and honour of the Nawab Vizier to liquidate. In a despatch from the Government of Bengal to the Court of Directors, dated the 9th of November 1816, the Governor General in Council reports that Mr. Strachey having brought the matter to the notice of the Nawab Vizier, he declined all concern with the claims in question, and that, under this positive declaration of the Nawab Vizier not to entertain the claim, the Government of Bengal did not feel itself warranted in pressing the claim further on his Excellency's attention without the express sanction of the Court of Directors, for whose consideration and orders the case was submitted. Subsequently, in a letter dated 12th of February 1819, the Court refused to sanction any further pressure being put upon the Nawab Vizier.

It is, therefore, in our opinion, proved that, as a matter of fact, the claim was repudiated by the native Government of Oudh.

The question then arises what is the effect of such a repudiation?

The debts incurred by Asoph-ood-Dowlah were very large, and, according to the statement of the Resident at Lucknow in a letter to the Governor General, dated 2nd of July 1795, "accumulated by mismanagement, and not by necessity,

for the revenues of the country were adequate, diminished as they were, to the necessary expenses of it." He says, "A heavy load of debt exists, overwhelms the resources of the Government, and, until put into a train of payment, precludes all steps to reform. The debtor, in consequence of the amount to which the debts have accumulated, cannot support his credit but by measures which furnish temporary relief and increasing embarrassments. He can borrow no money but at exorbitant interest and ruinous security. The creditor furnishes his assistance with a view of these distresses, demanding, not only greater profit in proportion to his risk, but the best security he can suggest. He finds it necessary, on the same principle, to make the period short, which the necessities of the debtor compel him to comply with. In this case it is difficult to say which imposes on the other. The wants of the debtor are great, and oblige him to sacrifice all that ought to establish confidence between man and man. He holds forth terms calculated to blind the creditor from seeing the dangers to which his property is exposed, and necessity thus forces his measures; on the other hand, the creditor pleads risk for availing himself of the necessities of his debtor, and both calculate on their success, while the revenues of the State suffer by this source of evil in addition to many more. The creditor, impelled at first to lend his money by the profits which it will yield him, listens to the terms, accepts the security tendered to him, and trusts partly to the honour of his debtor and partly to other influence to recover his money; for, in fact, there is no security where there is no law to enforce the terms of it. Aware of this, the creditor limits the period of payment to a short date, which not only increases his profits, but protects him from the effects of revolutions in the Government; to these, however, he must be subject, &c. The safety of the debt depends on the continuance of the debtor in power; and it is a circumstance very extraordinary that the Executive Government of Oudh has so established its influence by the pernicious principles on which it has so long existed, that neither the consent of the Nawab Vizier nor any act of his have been demanded by the creditor. How far the Executive Government may have pledged his territories for the payment cannot yet be known."

Eventually Rajah Tickait Roy, having been instructed by the Vizier to prepare a schedule of the debts due by the Government, delivered an account of such debts to the British Resident on the 3rd of November 1795. On the 31st of March 1796 the Vizier delivered to the Resident a paper containing the following statement:—"Now that I have examined the list of the Army, and the Ministers are deprived of their power, I have discovered their embezzlements." Another instance is as follows:—"They pursued a curious plan under the name of bankers and Europeans who had money concerns with the Government. They put lakhs of rupees, the profits of their own embezzlements, in the disbursements of my Government, and drew up bonds in the name of bankers and English gentlemen; for of the debts stated, near a half of it belongs to them. For example, in the bond to Colonel Martin for 25 lakhs more than three-fourths is theirs and one-quarter may be Colonel Martin's. In like manner is Mr. Johnson's bond, and several other gentlemen and bankers."

The Resident writes upon this:—"His Excellency observes in this paper that he has discovered their embezzlements. When he made this declaration he had not seen a paper, but had delivered the paper to me for inquiry.

"The result of this inquiry has been since delivered to him in writing, and purposely that he may pronounce his judgment and decide between the part of Tickait Roy's conduct, which has been wrong, and that which I could not in justice but commend. It is generally reported and believed, as the Vizier states, that Tickait Roy's dependants have involved themselves improperly in the loans; but I can yet procure no public instrument on which to proceed in this respect, &c. I beg leave now to observe that so long has the system been carried on, and so firmly united are all the creditors in a resolution to keep secret their own connection with the officers of Government, that nothing short of a declaration from the Vizier that, setting aside prejudice, he resolves to do strict justice will expound this intricate combination.

"It was adopted through fear of injustice, and rigid justice only will unravel it."

It appears from a letter of Mr. Lumsden, the Resident, to the Governor General, dated 28th September 1796, that Buddinauth Roy, Dhunput Roy, and others of the former Amlah of Rajah Tickait Roy, had acknowledged that

7,60,000 rupees

7,60,000 rupees of General Martin's debt, 51,000 rupees of Mr. Johnson's, and 50,000 rupees of Mr. Bruce's debt were their property.

We pause here for a moment to consider the position of Asoph-ood-Dowlah as Nawab Vizier. Although he exercised the rights of a sovereign, and although the East India Company had treated with him and his predecessors as such, he was still nominally dependent, and that dependence might at any time have become real had an energetic ruler sat on the imperial throne at Delhi. The Nawab Vizier of Oudh was not recognised as king by the British Government till 1819.

If Asoph-ood-Dowlah and his successors are not to be treated as sovereigns, it would, of course, follow that debts contracted by them, or in their names, would not be charges on the revenues of the State. We think they must be treated as sovereigns *de facto*, and if so, it was within the competence of Saadut Ally Khan, the successor of Asoph-ood-Dowlah, to determine to what extent the State was bound by these debts.

If he had reason to believe that his predecessor or his Government, without any adequate necessity, had contracted immense debts capable of ruining the nation, or that the creditors lent their monies on the personal responsibility of his predecessor as a life tenant, and not as believing, or having a right to believe, that the debts were a permanent charge on the revenues of the State, it was a matter on which he as sovereign was competent to decide. He clearly had the power to determine whether or not the State of Oudh was bound by these debts.

Apart from the special circumstances of this case, we think it may be laid down broadly that the sovereign power in a State, the authority to which is confided that absolute power which must in all Governments reside somewhere, is competent to determine whether or not it is bound by obligations entered into in its name. If it repudiate those obligations, the act of repudiation may be morally right or a flagrant wrong. It may be an act which in the opinion of others is disgraceful to the repudiating State; but can it be considered as inoperative? Could it be contended that any person subject to the law of France could assert a right to be paid in full the amount of an assignat which might be in his possession, notwithstanding the law of 1795, by which they were made redeemable by the delivery in lieu thereof of mandates at one-thirtieth of their nominal value? Was the repudiation of debts by the American Governments wholly inoperative? Could it for a moment be contended that these debts are still charges on the revenues of the Empire of France or the Government of the United States? We think not. The repudiation is binding at least on creditors who are subject to, or bound by, the laws or acts of the repudiating State.

In Pufendorf's "Law of Nature and Nations," Book VII., c. 2, s. 14, it is said—"Where the sovereignty is lodged in a single individual, there the State is supposed to choose and desire whatever that man (who is presumed to be a master of perfect reason) shall judge convenient in every business or affair which regards the end of civil Government."* Hence there naturally arises this question, whether, if he in whom the public will resides, wills otherwise than he ought to do, and consequently sins in the exercise of this public will, the action which proceeds from a will thus depraved is to be looked upon as the action of the State? For every person who submitted his own private will to that of the Prince is supposed to have done it with this intention, that the Prince should will nothing but what should be just in itself and advantageous to the public. It seems reasonable to pronounce that an action proceeding from the abuse and corruption of the public will is in itself a public action, or the action of the State, because performed by the sovereign as considered in that capacity. So Grotius, Book II., c. 14, s. 1, distinguishes "between the acts of kings which they do as kings and the private acts of those kings; for what they do as kings is looked upon as done by the whole nation." Pufendorf, Book VIII., c. 10, s. 7, says—"The prince may defer his payments when any pressing exigence of State obliges him to turn the money another way which should have been paid to the private subject, and from hence it appears what is to be determined about the *tabulæ novæ*, or general discharges from debts or obligations, which Solon calls *Σείραχθία*,
or

Quoted from the
English edition of
1729.

(*) As to the case where a question arises between the subjects of different States, see the judgment of Lord Ellenborough in *Conway Gray*, 10; East, 536.

or the shaking off a burden." Then, did the act of the Nawab Vizier bind Dwarka Doss?

It must be observed that the contract was made, and the debt became due and was payable, in the State of Oudh. The money appears to have been advanced by, and due to, Dwarka Doss, Motee Chund, which was the name of that branch of the banking house of Dwarka Doss which was established in Lucknow. The creditor, therefore, must be taken to have been a temporary subject of the State of Oudh, and in respect of this debt at least subject to the sovereign authority of the Nawab Vizier. Moreover, it is a general rule that a defence or discharge good by the law of the place where the contract is made, or to be performed, is good everywhere, and extinguishes the contract.

The conclusion at which we arrive is, that the debt now in question was repudiated by the Native Government of Oudh, and that by such repudiation the debt ceased to be a charge on the revenues of the State of Oudh.

The eighth issue is, whether the British Government is now liable to pay the money mentioned in the bonds and memoranda.

The answer seems very simple. As to public debts, Mr. Wheaton says:—"A mere change in the form of the Government, or in the person of the ruler, does not affect these obligations. The essential form of the State, that which constitutes it an independent community, remains the same; its accidental form is only changed. * * * The new Government succeeds to the fiscal rights, and is bound to fulfil the fiscal obligations of the former Government. It becomes entitled to the public domain and other property of the State, and is bound to pay its debts previously contracted."

We think that such obligation is confined to debts actually subsisting at the time of the transfer of the Government. To all other claims, to debts extinguished by the act of the former sovereign, the maxim would apply, "*Non debet quod rite et secundum leges ab initio actum est, ex alio eventu resuscitari.*"

The greatest practical injustice might be done if the rule were otherwise. In the present case we have persons lending money at usurious interest 24, 30, and 36 per cent., on the doubtful security of an officer of the Mogul Government * * * occupying the position of an independent sovereign. No doubt the lenders knew with whom they were dealing, and took a rate of interest sufficient to cover the risk of losing their money. The adventure was a loss. Are the subjects of the British Government or the State of Oudh now to be made liable to indemnify them, and pay this debt with the accumulated interest for so many years, for that is the right of the claimants if they are entitled to anything at all? The general rule as regards poor rates in England is, that a retrospective rate cannot be made, because it is unjust to make those who are to-day inhabitants of the parish, a fluctuating body, liable for the expenses of the parish in past years. If it be said that it is never too late to remedy a wrong, we should be prepared to say that a somewhat analogous principle must apply to such a claim as the present, where it is sought to make the people of India, or the present inhabitants of the province of Oudh, responsible for debts incurred by the mismanagement or extravagance of a sovereign who died 70 years ago.

5 April 1867.

(signed) John P. Norman.
C. Trevor.
G. Campbell.

EAST INDIA (OUDH).

COPY of a Despatch from the Registrar of the High Court of Judicature at *Fort William* in *Bengal* to the Secretary to the Government of India, Foreign Department, No. 1087, dated Calcutta, 5 April 1867, in reference to the CLAIMS of the Representatives of *Monohur Doss* and *Dwarkanah Doss* against the late Native Government of *Oudh*.

(*Sir Arthur Butler.*)

Ordered, by The House of Commons, to be Printed,
26 March 1868.

EAST INDIA (PROGRESS AND CONDITION).

S T A T E M E N T

EXHIBITING THE

MORAL AND MATERIAL PROGRESS AND CONDITION

OF

I N D I A,

DURING THE YEAR 1866-67.

(PRESENTED PURSUANT TO ACT OF PARLIAMENT.)

Ordered, by The House of Commons, to be Printed,
19 June 1868.

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STATEMENT

EXHIBITING THE

MORAL AND MATERIAL PROGRESS AND CONDITION OF INDIA

DURING THE YEAR 1866-67.

INTRODUCTORY.

Since the presentation of last year's Report on the moral and material progress of India, there have been two changes in the Chief Ministerial Offices of Government in India; viz., the appointment of the Right Honourable W. R. Seymour FitzGerald to be Governor of Bombay, and the selection of the Honorable W. Grey as Lieutenant Governor of Bengal.

In order to facilitate the presentation of the Indian Budget to Parliament, and to assimilate the date for closing the year in all future accounts with that of England, it has been determined that the official year in India shall terminate on the 31st March instead of the 30th April as heretofore. It is necessary, therefore, to explain that in the comparisons drawn in reporting the progress of last year, the information for 1866-67 will be for eleven months only, while that for 1865-66 will be for the whole period of the previous twelve months.

Following the precedent established in previous reports, the subjects will be dealt with under their respective heads of Department, in nearly the same order as before; and tabular statements have been introduced, condensed from the Reports received from each presidency or province of India, with the view of showing at a glance the comparative progress or retrogression of each branch of Administration.

Amongst the important events of the past year, though out of the usual routine of administration, may be mentioned the Expedition to Abyssinia, undertaken jointly by the Imperial Governments of England and India. The object of this Expedition was to obtain the release of certain British subjects who had been made captives by King Theodorus, and whom he persistently detained in his dominions. All the arrangements were carried out by Her Majesty's Indian Authorities, and the cost (excepting the ordinary pay of the troops in the service of the Indian Government which may be employed in Abyssinia) will be defrayed by the British Treasury. It is unnecessary here to enlarge upon this subject, as all the correspondence relating to it has been presented to Parliament. While this was passing through the press, the very satisfactory intelligence has been received of the termination of the Abyssinian Expedition by the taking of Magdala, the death of King Theodore, and the total defeat of his army. The troops are now on their return to India.

In consequence of the Administration Reports for Oude, Mysore, and Coorg not having been yet received, the information for these provinces is not contained in this year's Report.

AREA AND POPULATION.

Presidencies or Provinces.	Area in Square Miles.	Population.	Population to Square Mile.
Bengal - - -	214,313	39,813,278	185·77
N.W. Provinces - -	83,380	30,110,615	361·12
Punjab - - -	100,441	14,820,845	147·55
Oude - - -	22,456	8,838,151	393·57
Central Provinces - -	114,718	9,104,511	79·36
British Burmah - -	90,070	2,330,453	25·87
Madras - - -	141,719	24,206,509	170·80
Bombay - - -	87,639	11,093,512	126·58
Sind - - -	60,900	1,945,594	31·94
Coorg - - -	2,116	119,118	56·29
Hyderabad - - -	17,334	1,586,047	91·55
Mysore - - -	27,000	4,013,601	148·65
Under British Administration - - -	962,086	147,982,234	153·81
Other Native States - -	598,044	48,426,348	80·97
Total - - -	1,560,130	196,408,582	125·89

The administration of British Government in India extends over an area of 962,086 square miles, according to the most recent information, and the population consists of 147,982,234, giving a proportion of 153 to the square mile. The densest population is in Oude and in the North-West Provinces, as will be seen in the accompanying statement exhibiting the subdivisions of administration, with their respective areas and population. The area of other Native States was estimated at 598,044, with a population of 48,426,348.

During the past year a census of the population of the Central Provinces was taken for the first time. The population was counted in one night, quietly and easily, the inhabitants of cities and towns co-operating most cordially in giving every assistance to the officers employed.

The population of the chief Presidency towns was as follows, distinguishing the Europeans from the Natives, and showing the proportion of males, females, and children.

	Europeans and Indo-Europeans.	Hindoos.	Musselmans.	Other Natives.	Total.	Males.	Females.	Children.	Total.
Calcutta -	22,260	239,190	113,059	3,415	377,924	198,077	115,311	64,536	377,924
Madras -	16,368	325,678	63,886	21,839	427,771	134,302	165,307	128,162	427,771
Bombay -	10,306	523,974	145,880	136,402	816,562	436,305	207,285	172,972	816,562

A general census of the population throughout India has been ordered to be taken in 1871.

LEGISLATION.

During the official year 1866-67 thirty-six Acts were passed by the Council of the Governor General of India, as compared with 29 in the previous year, besides 33 Bills brought under consideration, seven of which have been introduced, three were published but not introduced, up to 23rd March 1867, and the remainder were in course of preparation.

Of the Acts passed, eight are general, affecting the whole of British India, and not applicable to any particular subject. Four are special; and four affect one or other of the High Courts. Two may be considered personal; of these, Act IX. of 1867 provides who should be Plaintiff or Defendant in suits by or against the French Bank of Paris in India; and Act XI. of 1867 empowers the Oriental Gas Company, who have already works existing in Calcutta and its environs, to extend their operations to other parts of British India, with the previous sanction of the Local Government. The remaining Acts were passed by the Council in its capacity of Local Legislature for the North-west Provinces, Oude, the Central Provinces, and the Punjab.

By Act XXV. of 1866, the Government of India have the power to take possession of sums of money lying unclaimed for upwards of twenty years in the hands of the High Courts of the three Presidency towns, deposited in the course of suits instituted in the late Supreme Courts of Calcutta, Madras, and Bombay. Such transfer being subject to any claims which may hereafter be established to the satisfaction of the Court from which such removal shall be made.

Many improvements have been introduced into the Law of property vested in mortgagees and trustees by Acts XXVII. and XXVIII. of 1866, and they include several

several amendments which have been at various times introduced into the English Law by the Statutes known as Lord St. Leonard's Acts, and others of more recent date.

The Government of India annually sets apart the sum of 2,000*l.* for the improvement of the navigation of the Ganges between Allahabad and Dinapore; but this sum not being sufficient for a work of so much importance to the commerce of the country, the Lieutenant Governor of the North-west Provinces is empowered by Act I. of 1867 to levy tolls on steamers and vessels at such places as he may select. The tonnage on which the tolls are to be levied in the case of steamers and flats is to be calculated according to a method already in practice on the Nuddea rivers.

Certain arrangements regarding the sub-proprietary settlements and rights of occupancy in Oude were mentioned in the Report for 1865-66 (page 5). Those arrangements were made in accordance with the views taken by the Government of India, by the Chief Commissioner, and with the consent of the Talookdars. But doubts having arisen regarding the legal validity of some of the measures so provided for, Act XXVI. of 1866 was passed to give them the force of law.

In last year's Report mention was made (page 21) of an enactment passed by the Bombay Government for the suppression of gambling. In the North-west Provinces, Punjab, Oude, Central Provinces, and British Burmah, as the law existed, no persons could be prosecuted for such offence, except it could be shown under the Penal Code that their acts caused "common injury, danger, and annoyance to the public;" hence the passing of Act III. of 1867, for the punishment of public gambling, and the keeping of common gaming-houses, in the Provinces named.

To provide for the appointment of Municipal Committees in towns in the Punjab; and for the police, conservancy, and local improvements of such towns, Act XV. of 1867 enacted that such committees are not to consist of less than four members besides their presidents; the latter may be appointed by the Lieutenant-Governor himself, or be elected, as he may direct. The power of removing any member and the filling up of vacancies is also vested in the Lieutenant-Governor. The Committees are empowered, under the sanction of the Lieutenant-Governor, to impose taxes, to make rules as to meetings and business, and as to the appointment, suspension, and removal of officers and servants, to make byelaws as to nuisances, and for the registration of births and deaths. The Committees are also to provide for the maintenance of the necessary police establishments. The Lieutenant-Governor is enabled to suspend or limit any of these powers, and to cancel any of the proceedings and rules of such Municipal Committees. This Act is to remain in force for five years, and may be extended to the Central Provinces and Oude.

Act XXI. of 1867 imposes a duty or license tax on the exercise of professions and trades, and is applicable to civil servants whose annual receipts are not less than 100*l.*, and to military officers whose pay and allowances are not less than 600*l.* a year. The assessment is divided into six classes, the minimum being 20*l.* and the maximum 2,500*l.*; and the rate of assessment is fixed at two per cent. on the minimum profits of each class. Joint stock companies are placed in a separate class. The proceeds of the tax will, for the first year, be credited to the revenues of *India*. After which they will be credited to *local revenues*; a moderate proportion of expenditure on objects of a local character, now charged to the revenues of India, being thenceforward transferred to local funds.

An Act was passed, No. XXII. of 1867, modelled on certain sections of the English Common Lodging-Houses Acts, providing for the regulation of Sarais or buildings used for the shelter and accommodation of travellers, and Puraos or halting-places in the open country. It regulates the registration, cleansing, and repairing of such buildings, for the appointment of proper persons as keepers, and for the maintenance of watchmen to ensure protection to travellers from robbery. At present this Act is only applicable to the North-west Provinces, but can be extended to other parts of India.

In order to provide a speedy mode of trying and punishing offences attributable to religious fanaticism, and of rendering attempts at murder made under such influence punishable with death, instead of transportation as under the Indian Penal Code, Act No. XXIII. of 1867 was passed, but to be in force only in such of the districts of the Punjab as the Lieutenant Governor shall declare to be subject to its operation. Fanatics so convicted will be sentenced to death or transportation for life, forfeiting all their property to Government. Trials are to be held with the aid of two or more assessors, without exemption. There

is to be no appeal, and sentence is to be carried into execution at once. Jurisdiction is conferred by this Act to Commissioners of Divisions and to Magistrates with full powers, specially vested with such jurisdiction after commission of the offence. The Act to expire in ten years or earlier as the Governor General in Council may direct.

The passing of Act X. of 1865, entitled the "Indian Succession Act," having been found to affect seriously the office of Administrator-General, diminishing to a great extent the value of the rights and privileges heretofore reserved to him, it has been enacted by No. XXIV. of 1867, that the Administrators-General of India be practically replaced in the position occupied by them before and at the passing of the said Succession Act; this Act enables the High Courts of Calcutta, Madras, and Bombay to grant administrative powers to the Administrators-General of each Presidency, in respect of assets to be collected throughout the whole Presidency, thus saving the expense of applying to the local courts of the Provinces within which the assets are situated. The jurisdiction of the Administrator-General is extended by this Act to all persons besides British subjects, not being Hindoos, Mahommedans, or Buddhists. In order to avoid vexatious suits, a creditor who sues an Administrator-General in respect of a debt due from an estate under his charge, will be liable to pay the costs, and will not be entitled to have the decree enforced, unless the claim shall have been duly submitted for adjustment without success; and under no circumstances will a judgment entitle him to priority over other creditors. A private executor or administrator can transfer his duties to the Administrator-General by an instrument in writing duly stamped, and notified in the local gazette. The Governor-General of India in Council is empowered to raise the commission of the Administrator-General of Bengal from three to five per cent., as charged in the Presidencies of Madras and Bombay; and he can appoint a Deputy Administrator for the North-west Provinces, Punjab, Oude, and the Central Provinces. All future Administrators-General are to be barristers of the United Kingdom, and to give security to the Secretary of State instead of to the Government of India as hitherto.

The regulation of printing presses, periodicals, newspapers, for the preservation of copies of every book published or privately printed in British India, and for their registration, has been provided for by Act XXV. of 1867.

Certain doubts having been raised as to the legality of sentences passed by the Petty Sessions Courts founded on the model of the English Quarter Sessions, it was found necessary to pass Act No. XXVIII. of 1867, in order that all sentences heretofore passed by magistrates should be deemed valid.

JUDICATURE.

Bengal.

	1865.	1866.
Cases instituted during the year - - -	1,211	1,056
Total cases under trial -	1,601	1,467
Cases disposed of -	1,192	1,023
Cases pending at close of the year - - -	409	444

	1865.	1866.
Appeals instituted - -	4,828	4,697
Appeals decided - -	5,654	4,444
Appeals pending on 31st December - - -	1,834	2,087

THE annexed statement shows the working of the High Court of Calcutta, on its Original side, in its Administration of Civil Justice. The amount litigated in suits other than those for accounts, partition, and possession of lands was 774,064*l.* in 1866, against 780,649*l.* in 1865. The number of Judges presiding over this Court was 13.

On its Appellate side, the total number of appeals of all descriptions instituted, decided, and pending at close of the year is also shown in the accompanying statement. Considerable progress has been made in reducing the files, and the amount of arrears at the end of the year 1867 is expected to be much less.

	Suits instituted in		Suits pending at Close of Year	
	1865.	1866.	1865.	1866.
Small Cause Court Class -	81,862	80,922	6,445	6,147
Other cases - - -	56,757	60,815	17,642	18,847
Total - - -	138,619	141,737	24,087	24,994

The operations of the Civil Courts subordinate to the High Court as shown in the margin give an increase in the aggregate number of cases instituted; but there appears to have been a decrease in the number instituted in 1866 of the Small Cause Court class, as compared with the previous year.

The

The following statement shows the aggregate working of all District Courts of the several grades for 1865 and 1866 :—

In Courts of	Suits instituted, Originals and Appeals.		Suits decided on their Merits, Originals and Appeals.		Total Number of Cases disposed of, Originals and Appeals.	
	1865.	1866.	1865.	1866.	1865.	1866.
Judges - - -	19,938	20,917	11,343	9,554	12,302	10,362
Principal Sudder Ameens -	3,965	3,615	13,519	13,078	14,402	13,858
Sudder Ameens - - -	4,824	4,728	4,361	4,754	4,850	5,338
Moonsiffs - - -	109,892	112,477	99,940	101,073	112,900	115,611
Total - - -	138,619	141,737	129,163	128,459	144,454	145,169

The aggregate value of suits decided was 4,179,842*l.* in 1865, and 4,071,957*l.* in 1866; and of those pending in 1866, 1,932,393*l.* against 2,211,056*l.* in the previous year.

	1865.	1866.
	£	£
Net amount of Stamp Fees realised in all the Courts	182,756	180,715
Total cost of Courts -	170,495	174,195
Balance - - -	12,261	6,520

The total cost of the District Courts for the last two years was less in each year than the amount realised from stamp fees, the balance in favour of Government having been 12,261*l.* in 1865, and 6,520*l.* in 1866. It will thus be seen that these Courts pay themselves from the fees realized from this source of revenue.

The receipts of the year under review, on account of fees collected in the Small Cause Courts of Calcutta, amounted to 20,523*l.*, while the cost of Establishment, including rent, was 14,125*l.*, leaving a balance of 6,398*l.* against a surplus of 7,714*l.* during a corresponding period of the previous year. The cost to Government of the Small Cause Courts in the districts was 28,105*l.* in 1866, while the net income, after deducting refunds of stamps, amounted to 22,150*l.*, showing a net charge to Government of 5,955*l.*, which was less by 2,699*l.* than the net charge incurred in 1865. The Small Cause Courts at Chittagong, Nattore, and Comercolly, have been closed from want of business, and a new Court has been established at Darjeeling.

In January 1867 the first examination was held for the qualification, admission, and enrolment of pleaders, &c. under Sec. 4. of Act XX. of 1865, in all the District Courts of Bengal, from which a great improvement was expected in the working of the subordinate courts in course of time.

Courts of Magistrates.	1865.	1866.
Number of cases tried -	69,231	80,920
Number of persons under trial - - -	130,307	150,431
Convicted - - -	63,717	76,372
Committed - - -	4,156	7,560
Released - - -	58,534	62,072
Otherwise disposed of -	908	1,017
Remaining under trial at end of the year - -	2,992	3,410

A large increase occurred in criminal cases, as will be seen on reference to the accompanying table. This increase is due to the famine which existed, driving the starving population to commit robberies and thefts to an unprecedented extent.

Measures have been taken by Government for facilitating the realization of fines imposed by Criminal Courts in many districts, which will, it is hoped, prevent the large accumulation of arrears for the future.

In order to obviate the evils contingent on the practice of bringing down European subjects from long distances to be tried at the Presidency town on criminal charges, arrangements have been made for their trial under a special commission at or near the place of their alleged offences; and to meet the difficulty arising from the want of suitable accommodation at the jails of Patna, Bhaugulpore, Moorshebad, and Dacca, which places have been selected for the sittings of such commissions, steps have been taken for the immediate construction of additional accommodation for the occupation of European prisoners.

The system of trial by jury, which has been in operation in certain districts of the Lower Provinces, is still under consideration of the Government of India. The want of success has not justified its extension to other parts at present.

In order to enable the joint-magistrate, or senior officer exercising similar powers, to render more useful assistance to the magistrate than hitherto, a plan has been devised and already adopted in several of the divisions of the Lower Provinces, for placing those officers in charge of the principal subdivision of the district in a position to exercise therein the powers of a magistrate.

Two new subdivisions have been established in Cachar and Durrung Districts, with a view of bringing the tea gardens of those parts within convenient reach of a magistrate.

North-west
Provinces.

The aggregate amount of litigation in the ordinary Civil Courts of the North-west Provinces, exclusive of the High Court (late Sudder Court) and the Small Cause Courts, for 1865 and 1866, will be seen from the following table :—

Years.	Suits instituted, Originals and Appeals.	Cases decided on Trial.	Cases finally dis- posed of.	Pending at close of Year.
1865 - -	68,155	58,123	67,823	9,278
1866 - -	78,673	64,151	79,351	8,196
Increase -	10,518	6,028	11,528	—
Decrease -	—	—	—	1,082

The causes to which the increase in the number of suits instituted may be attributed are the larger number of districts in which land revenue settlements are in progress, the changes in the cotton trade, and more generally the increase in the wealth and prosperity of the country. It is satisfactory to note that the cases disposed of were greater in number than in the year preceding, and that the cases pending at close of the year were less by 1,082.

Of the cases instituted during the year, 65,440 were original suits, and 13,233 appeals, as compared with 57,372, and 10,783 respectively in 1865.

	1865.	1866.
For real property -	4,984	13,603
„ debts on land -	37,752	41,737
„ other suits -	14,297	9,514
Total -	57,033	64,854
Add cases re-instituted or excluded - }	339	586
Total -	57,372	65,440

The classification of the 65,440 original suits, as shown in the margin, exhibits a considerable increase when compared with the previous year.

Out of the large number of original suits, decided by the Moonsiffs, 31,650 related to moveable property of less value than 10/. Under the recommendation of the High Court of these Provinces, Government, with the view of affording relief to judicial ma-

chinery, empowered Moonsiffs to dispose of such cases as Judges of Small Cause Courts. As a proof of the necessity for such relief, out of these 31,650 suits, in 25,000 no appeal was preferred, yet in the possibility of such a contingency a full record and a minute procedure was required.

The number of cases disposed of in all the Courts were decided as shown below :—

	Ex parte.	On Confession.	By Arbitration.	Dismissed on Default.	Adjusted or withdrawn.	Decided on Merits.	Total.
1865	6,945	14,324	1,859	2,805	6,895	34,995	67,823
1866	7,851	16,043	2,151	3,214	10,094	39,998	79,351

	1865.	1866.
Cases instituted - -	125,269	133,557
Cases decided { on merits -	83,796	87,761
{ finally disposed of - }	147,460	134,071
Cases pending at close of the year - }	16,624	16,412

The miscellaneous business of the Civil Courts of these Provinces will be seen in the statement annexed, as compared with the work for 1865. It is satisfactory to observe the increase in the number decided on their merits, and a decrease in the number of cases pending.

In regard to applications for the execution of decrees, the High Court have adopted measures with the view of assisting the decree holder in the legitimate prosecution of his claims, and at the same time of preventing the decree

the legitimate prosecution of his

decree being kept suspended on the debtor for any indefinite period without real action on the part of the decree holder.

The number of persons imprisoned for debt was 586 in 1865, and the amount of debt due by them was 41,767*l.*; while in 1866 the number confined was 610, and the amount of debt 16,582*l.*

In Judges and subordinate Courts.	1865.	1866.
	£	£
Net aggregate value of stamps filed -	89,719	100,271
Cost of Judicial Establishment - - -	101,519	97,915
Net loss - - -	11,800	—
Net gain - - -	—	2,356

The financial result to Government of the District or ordinary Civil Courts in the North-west Provinces was very favourable in comparison with the year preceding; and if to this be added the net gain arising from the Ameen's fund, which in 1866 amounted to 5,906*l.*, it would make the total net gain to Government of 8,262*l.*

The High Court of Judicature for the North-west Provinces commenced its

	1865.		1866.	
	Regular.	Special.	Regular.	Special.
Total Appeals for hearing -	178	2,158	280	2,832
Dismissed on default -	2	117	—	181
Adjusted or withdrawn -	2	16	1	13
Confirmed - - -	66	843	108	1,419
Amended - - -	29	39	21	54
Reversed - - -	15	152	40	230
Modified - - -	4	305	6	464
Total disposed of - -	118	1,472	176	2,361
Pending at close of each year - - -	60	686	104	471
Value of regular and special Appeals instituted, including those pending	£ 487,028		£ 1,182,211	
Value of those decided -	345,341		334,860	
Value of Appeals pending -	141,687		847,351	

sittings in June 1866, superseding the functions of the Sudder Court, with which the comparative operations on its Appellate side are shown annexed. While the Appeals to be heard during the year increased as compared with 1865, the number pending at close of the year was less by 171 than in the previous year. The value of Appeal Suits has also increased largely. The average duration of Suits in the High Court for 1866 was 3 months and 28 days. The net amount realized from sale of stamps, &c. was 10,626*l.*, and the cost of establishments 36,408*l.*, leaving a net cost to Government for the Judicial machinery of the High Court at 25,782*l.* In addition to the fore-

going disposition of work in this Court, 156 Miscellaneous Appeals were decided, and orders were passed in 549 miscellaneous petitions, exclusive of 174 applications for the admission of special appeals.

Having dealt with the Ordinary or Civil Courts of Judicature in this Province, as well as the High Court for the Regulation Districts, it now remains to notice the operations of the Civil Courts in the Non-regulation Districts, of which there are four; and the following statement will show the number of Suits instituted, disposed of, and pending for the year 1866:—

	1866.
Total Cases instituted	16,197
Total disposed of -	15,250
Pending at close of the year - - -	1,365

The number of Suits instituted exceeded that in 1865 by 5,019, and the number pending at close of year was greater by 330.

The greater portion of litigation in these Non-regulation Districts is disposed of by Uncovenanted Civil Judges, whose pay, hitherto, has been inadequate to their position and to the work undertaken by them. A scheme for the improvement of their salaries has, therefore, been approved of by the Government of

India, and sanctioned by the Secretary of State. At the same time an Act has been submitted for the consideration of the Legislative Council, by which the jurisdiction of Moonsiffs will be enlarged, the Lower Appellate Courts strengthened, and the right of appeal limited, which will greatly improve the administration of Civil Justice.

	Small Cause Courts, 4 Courts.		Cantonment Small Cause Courts, 11 Courts.
	1865.	1866.	1866.
Total number of cases under trial - - }	6,417	6,885	4,343
Ex parte - - - - -	1,113	1,168	843
Confession - - - - -	2,049	2,206	1,107
Arbitration - - - - -	75	60	159
Decided on merit - - -	1,876	2,149	1,083
Dismissed on default - -	228	242	342
Adjusted or withdrawn -	943	967	689
Total cases disposed of	6,284	6,792	4,223
Cases pending at close of year - - - }	133	93	120

The operations of the Small Cause Courts, of which there are four in number, will be seen in the accompanying comparative table. Eleven Cantonment Small Cause Courts have also been established under the provisions of section 6, Act XXII. of 1864, the business of which has been disposed of with promptitude. Nearly half of the suits instituted were for recovery of shop debts. The total net receipt from stamps and other sources was 722*l*. The cost of these Courts amounted to 328*l*.

leaving thus a net gain of 394*l*. The average duration of cases in the four Small Cause Courts was nine days in each of the years 1865 and 1866. With the exception of the Court at Allahabad, these Courts are self-supporting, though in the aggregate the net loss to Government was 67*l*. in 1866, as compared with a loss of 138*l*. in 1865. These Courts have been now established nearly six years, and their working has been pronounced most successful. Suitors went freely to them, and the decisions appear to give satisfaction. It is in contemplation to increase their territorial jurisdiction.

Central
Provinces.

The machinery for the Administration of Civil Justice in the Central Provinces remained unaltered; neither have any material changes of practice or procedure been introduced into the Courts during the year under review. Unremitting attention continued to be paid by the higher judicial authorities to the inspection and supervision of the Lower Courts, and both European and Native Judges have improved in their powers of eliminating speedily and accurately the real issues between contending parties.

Years.	Number of Original Suits.	Value of Property or Rights in- volved.
		£
1861	19,288	119,333
1862	26,931	Not stated
1863	28,655	227,121
1864	32,655	200,296
1865	39,188	312,449
1866	45,250	487,997

Accompanying is shown the number and value of suits instituted during the past six years. The large and progressive increase may be taken as some index of the advancing prosperity and wealth of the people, and of the growing popularity of the Courts.

The increase in litigation is reported to be in nearly the same proportion throughout almost every class of suits. By far the largest number, however, was under the class entitled "Debts on unregistered bonds," being 20,612 in 1865, and 21,517

in 1866. In about one-fifth of the whole civil litigation, as in last year, the suits were between money-lenders and agriculturists. The number of cases in which bankers or traders sued each other fell from 4,028 to 3,327 in 1866. This decrease is assigned to the comparative quietude of the cotton market, the great fluctuations of which during 1865 drove traders of a certain class to the Courts. Out of 45,594 suits for disposal during 1866, only 1,268 cases were pending at its close. The average duration of each suit was 14 days, and in no district of these Provinces was the average duration above 25 days.

The mode in which cases were disposed of may be classified thus:—Of total cases 15 per cent. were struck off on default; 8 per cent. were settled out of Court by compromise; 34 per cent. were by confession; 11 per cent. were decided ex parte; nearly 1 per cent. referred to arbitration; and 23 per cent. were decided on merits. It may be worth remarking that these per-centages were almost identical with the decisions of last year.

Attention has been given to suits referred to arbitration; and the reason assigned for so few cases being submitted to this mode of settlement is that the people know that they can obtain it if they wish, but they prefer the authoritative decision of the officers of the Court.

The Appellate business during the years 1864 and 1865 showed a decrease, but it rose in the year 1866, having been 1,207 against 994 in the preceding year. The number of Appeals, however, was still inconsiderable when compared with the number of cases which were contested.

Among

Among the miscellaneous business that came before the Courts, 21,050 applications for executions of decrees were recorded, as against 21,795 in the preceding year. Greater attention is being bestowed on the disposal of the miscellaneous work by the Courts, an improvement being much needed in this branch of civil business.

The Small Cause Courts continue to work with great popularity and usefulness. The number of suits in these Courts was 11,143, as compared with 4,782 in the previous year. Of this large increase, 7,000 suits were laid in the Small Cause Courts of Nagpore and Jubbulpore.

A considerable number of candidates have passed the prescribed examination, and have received certificates as authorized pleaders during the year.

	1864.	1865.	1866.
Cognizable cases -	18,900	22,297	23,797
Non-cognizable cases -	11,754	11,279	11,359
Total -	30,654	33,576	35,156

The tendency towards increase in the number of criminal offences was still apparent. A comparison for the last three years shows an increase of 1,580 on the preceding year, and of 4,502 over that of 1864. The increase was still confined to the class of minor and less

heinous crimes. The general increase in reported crime is, in a large measure, due to greater activity on the part of the Executive in bringing offenders to justice. With regard to the worst kind of crimes the increase was but small, being 238 in 1866 against 229 in the year preceding; while in 1863 it was 340.

In minor crimes, and under the head of "Theft" and "Housebreaking," the returns show an increase in cases reported of 548 over those in 1865, and of 2,080 over those in 1864. The value of property stolen was 44,353*l.*, while in 1865 it was 46,613*l.*, and the proportion recovered was 33 per cent. as compared with 31 per cent. in the year before.

	1865.	1866.
Number of persons under trial -	38,095	41,905
Remaining under trial at close of the year -	117	209

The despatch of business in Magisterial Courts has been conducted with promptitude, as may be seen from the comparatively few persons under trial at the close of the year.

There are now 62 honorary magistrates in these Provinces, who decided as many as 4,464 cases during the year, as compared with

4,114 in 1865. Most of the Natives, who are persons of rank and position in the country, are very popular as magistrates, and are reported to have acted in a most praiseworthy manner in the exercise of their judicial powers, affording valuable aid in Criminal administration.

Three important changes occurred during the past year in the Judicial system of the Punjab. A Chief Court, with two Judges (one a barrister), was established to supersede the Court of the Judicial Commissioner, and was opened on the 19th of February 1866. The Code of Civil Procedure of the Regulation Provinces (Act VIII. of 1859) was extended to the Punjab under certain restrictions, and the admission of Pleaders and Mookhtars to practise in the courts.

Punjab.

	1865.	1866.
Suits pending -	4,057	6,491
Suits instituted -	140,315	165,970
Total for hearing -	144,372	172,461
Suits disposed of -	137,881	166,558
Pending at close of the year	6,491	5,903

The number of Civil Suits instituted was large as compared with other Provinces, and shows also a considerable increase over the number instituted in the previous year. This increase, which was but nominal, was chiefly observable in that class of cases known under suits regarding land paying revenue to Government, and arises from the working of Act XIX. of 1865, by which suits

for land or revenue, rent or produce of land, were transferred from the Revenue to the civil side of the District Courts, the returns for which have hitherto been dealt with differently; but, deducting this class of suits, there still appeared to have been an increase of 8,537 in the number of Civil Suits instituted, over the previous year. Litigation has been steadily increasing for many years past in the Punjab. The additional wealth of the Province, combined with the greater facilities for resorting to the Civil Courts, may account in a great measure for this growth.

Of the suits disposed of, 63,798 were decided on their merits, against 51,537 in 1865, and the total value of suits in all the Civil Courts was 876,039*l.*, giving an average value of 5*l.* 4*s.* for each suit in 1866, against an average value of 5*l.* 10*s.* in 1865. The total cost of suits amounted to 83,219*l.*, or 9·5 per cent. on total value litigated. The average cost of each suit was 8*s.* 9*d.*

Included in the Civil Courts just mentioned are eight District Small Cause Courts, and a similar number of Cantonment Small Cause Courts, respecting which, generally, favorable testimony continued to be borne, by the district and divisional officers, as to their efficiency and popularity among the community.

		District Small Cause Court.	
		1865.	1866.
Cases for hearing - -	-	23,231	25,087
Cases disposed of - -	-	22,895	24,811

Of the cases disposed of, 36·3 per cent. were decided on their merits in the District Small Cause Courts, and 23·8 per cent. in the Cantonment Courts; 27·2 per cent. were decided on confession in the former and 41·2 per cent. in the latter Courts.

		1865.	1866.
		£	£
Total income - - -	-	9,976	10,511
Total expenditure - -	-	11,248	11,034
Net loss - - -	-	1,272	523

The operations of the District Small Cause Courts showed a considerable increase, both in the number of cases for trial, and in those disposed of, the average duration of each case varying from 4 to 11 days. In the Cantonment Small Cause Courts 6,509 cases were disposed of, as compared with 5,859 in the preceding year.

The financial working of these Small Cause Courts in the districts may be seen in the accompanying table, and it is satisfactory to find that the net loss was considerably less than in the previous year.

		1865.	1866.
Number of appeals for hearing - - -	-	13,892	19,345
Total disposed of - -	-	12,028	17,073

The appellate business of the Civil Courts of all grades in the Punjab is exhibited annexed, and includes the Chief Court in 1866 as compared with the Court of the Judicial Commissioner in 1865. The average duration of each appeal was 42 days against 34 in 1865. The additional

number of appeals for hearing would naturally arise from the increase of civil business previously mentioned.

There were also 92,382 miscellaneous cases for disposal, including those pending from previous year. Of these 72,151 were applications for execution of decrees, and 672 applications for leave to sue *in formâ pauperis*. While 88,939 decrees were granted during the year, the number of applications made to the Court for execution was 66,344. The total amount realized in execution of decrees was 157,050*l.*, or 36 per cent. of the aggregate value of decrees put in execution.

Rules were also issued for the qualification, admission, and enrolment of proper persons as Pleaders in the Chief Court and the Subordinate Courts in the Punjab. Eleven persons have been admitted as Pleaders, and seven as Mookhtars. Besides these there were several gentlemen practising in the Chief Court and Subordinate Courts who have been admitted as Advocates or Pleaders of the High Courts, and as such were qualified to practise in the Punjab Courts, without requiring to be enrolled in the Chief Court.

The law regulating the Administration of Civil Justice in the Punjab has now become more closely assimilated to that in force in the North-west Provinces. There yet remain some points of distinction between the Judicial systems of the two Provinces.

		1865.	1866.
Cases brought to trial:			
Bailable - - -	-	30,935	33,710
Not bailable - - -	-	13,488	13,047
Total - - -	-	44,423	46,757
Persons brought to trial -	-	91,159	103,678

The original Criminal business of this Province showed an increase in the number of cases and in the number of persons brought to trial. This increase has been steadily advancing for some years past, particularly in the number of prosecutions in bailable cases, and was attributable, in the first place, to the fact that many offences of a very petty character, which used formerly to pass unnoticed

unnoticed, were now brought into court and shown in the returns. In the next place, the tendency of recent legislation has been to create new offences: of this the Stamp Act may be mentioned as an instance. Another cause was the increased facility which has been afforded in recent years for instituting such prosecutions; in regard to which, the Judges of the Chief Court observe that, "so far as this " increase evinces a readier disposition on the part of the people to refer their " quarrels to the authorized tribunals instead of seeking redress by unautho- " rized means, it is a matter of congratulation rather than regret. But there " is reason to fear that the facility and cheapness with which the Criminal Courts " can be resorted to has tended to foment petty litigation, and has had a " demoralizing influence among the people. To unscrupulous individuals a " prosecution in the Criminal Court offered the readiest means of gratifying " private animosity, or compelling an adversary to yield to an unjust or doubtful " demand. Under these circumstances the Court observe with satisfaction that " in the recent Act amending the Stamp Law provision has been made for the " imposition of a Stamp duty in this class of cases."

	1865.	1866.
Suits filed -	8,547	10,099
Value of property litigated -	£ 145,326	£ 190,646

A considerable increase is noticeable in Civil litigation in the Hyderabad assigned districts when compared with 1865. The excess in the number of suits filed amounted to 1552, and in the value of property litigated to 45,320*l*. The average value of each suit rose from 17*l*. 7*s*. 6*d*. to 19*l*. 11*s*. 5*d*. The average duration of suits was

Hyderabad assigned districts.

47 days, as compared with 85 days in 1865, thus exhibiting a marked improvement in the time occupied in the trial of Civil cases in these Courts. The number of cases disposed of was 9,740, of which 6,970, or 71·56 per cent., were decided on their merits; 2,444, or 35·05 per cent., were compromised; 201 were dismissed on default; and 125 were withdrawn by the Plaintiff.

	1865.	1866.
Appeals for hearing -	1,066	1,009
Decided on merits -	796	810
Otherwise disposed of -	137	115
Total -	933	925
Pending at close of the year	133	84

The business of the District Appellate Courts in this Province exhibited a decrease in the number of appeals for hearing when compared with the previous year; but the number of cases decided on their merits had increased, thus leaving a less number pending at the close of the year. The average duration of appeal suits in District Courts fell from 87 to 65 days in 1866, and

in the Chief Commissioner's Court from 206 to 62 days. As many as 814 persons were imprisoned for debt during the year under review.

	1865.	1866.
Criminal offences -	7,756	9,558
Convictions -	4,279	5,474

A corresponding increase appeared in the aggregate of reported Criminal Offences, and in the number of convictions; this was not so much due to any real increase in crime, as to a greater willingness, apparent on the part of the people,

to report offences, and to the improved efficiency of the police. The results of trials show that out of 5,437 reported number of cases, the per-centage in which no apprehensions were made was 19·30; the per-centage of convictions was 51·58; and the per-centage of acquittals 28·82. Of the 5,474 convictions by the magistrates 3,607 were fined, 92 were flogged, and the rest were imprisoned. Thus it will be seen that fine has been resorted to liberally, but the Whipping Act had not been so generally enforced. The attention of the district officers had been called to this fact.

In British Burmah the Courts constituted for the Administration of Civil Justice consisted of two Recorders Courts and two Small Cause Courts, one of each is located at the chief seaport towns of Rangoon and Moulmein respectively. In addition to these there are 116 Courts of six classes, for the districts in the interior.

British Burmah.

Recorders Courts.	Original Suits.		Miscellaneous Cases.	
	1865.	1866.	1865.	1866.
Number pending -	31	71	19	15
Instituted during the year -	411	393	438	512
Total - - -	452	464	457	527
Suits disposed of - - -	381	391	442	504
Pending at close of the year	71	73	15	23

suits were unconnected with immoveable property, and 8 were suits for new trials and reviews of judgment under Sec. 28. of Act XXI. of 1863.

Small Cause Courts.	Original Suits.		Miscellaneous Suits.	
	1865.	1866.	1865.	1866.
Number pending - - -	125	129	13	13
Suits instituted during the year - - - -	4,637	4,581	1,778	1,921
Total - - - -	4,762	4,710	1,791	1,934
Suits disposed of - - -	4,633	4,551	1,778	1,890
Number pending at close of the year - - - -	129	159	13	44

From the accompanying table it is apparent that there has been an increase in the number of suits instituted, disposed of, and pending in the Recorders Courts of these Provinces. Until October 1866 there was but one Recorder, but on that date a separate Recorder was provisionally appointed for Moulmein. Of the original suits instituted in these Courts 31 were suits for immoveable property, 354

In the Small Cause Courts the number of Original Suits instituted and disposed of in the year under review have decreased, as compared with 1865; and the number of suits pending have increased. This result chiefly applies to the Court at Moulmein. The separate Judgeships of these Courts has been abolished, and the business is conducted by Registrars. The average duration of suits in these Courts was eight days.

The value of suits in both Courts amounted in 1865 to 174,368*l.*, and in 1866 to 161,237*l.* The value of stamps filed was 6,284*l.* in 1865, and 6,445*l.* in 1866. The total cost per annum of the establishment of these Courts was 6,618*l.*

The operations of the District Courts in the interior of these Provinces showed a decided increase in the aggregate of all cases before these Courts, this increase being mainly in Original Suits.

	1865.			1866.		
	Appeals.	Original.	Miscellaneous.	Appeals.	Original.	Miscellaneous.
Number of cases pending -	138	399	99	132	324	47
Number instituted during the year - - -	1,421	17,421	6,992	1,489	19,590	7,169
Total - - - -	1,559	17,820	7,091	1,621	19,914	7,216
Cases disposed of - - -	1,427	17,496	7,044	1,535	19,627	7,156
Number pending at close of the year - - -	132	324	47	86	287	60
Amount of property litigated in Original Suits -	£ 163,148			£ 140,335		
Value of Stamps - - -	8,228			9,999		
Costs of every description in Original Suits disposed of - - - -	13,447			17,163		

The value of property in Original Suits brought before the Courts was less by 22,813*l.*, while the value of stamps filed was greater by 1,771*l.* This apparent anomaly was explained by the fact of there having been a decrease of a large amount, both in the value of suits and of stamps filed, in the Tenasserim Division, while in the Pegu Division their value was correspondingly great. The decrease above mentioned was assigned to the stagnation in the trade of teak timber, the

chief staple of commerce in this part of the country. Of the Original Suits disposed of 61 per cent. were decided on merit, against 83 per cent. in the year preceding; and in the disposal of the 1,535 Appeals, 86 suits were appealed to the Commissioners of Divisions from Courts immediately under them, 77 from Courts of Assistant to Deputy Commissioners, and 1,372 from Courts of the three grades of Extra Assistant to Deputy Commissioners.

In the Chief Commissioner's Court the total number of appeals and miscellaneous cases pending and instituted during the year was 51; the number of cases disposed of was 40, leaving 11 cases pending at the close of the year. The average duration of suits disposed of in this Court was two months and five days.

Eleven District Moonsiffs Courts were abolished in the course of the past year. In order to facilitate the disposal of arrears of Civil business in some of the Subordinate or District Courts, it was found necessary to relieve certain Principal Sudder Ameen, and such Judges of District Small Cause Courts as had been invested with powers of a Principal Ameen of Criminal cases. The jurisdiction of the Civil and Sessions Court at Berhampore has been extended. Madras.

	1865.	1866.
Total Suits for hearing	231,718	232,740
Decided on merits -	103,618	109,128
Dismissed on default -	14,406	13,728
Adjusted or withdrawn -	47,348	43,747
Otherwise disposed of -	4,025	3,293
Total disposed of -	169,397	169,896
Pending at close of the year - - - -	62,321	62,844

The aggregate of Original Jurisdiction in all the Courts of the Madras Presidency, including Small Cause Courts, but exclusive of the High Court, will be seen in the accompanying statement. The total value of property at stake, pending at the close of the year, amounted to 1,748,407*l.* against 1,502,243*l.* at the close of 1865. Of the cases decided on merit, 87,576 were in favor of Plaintiffs, and 21,552 in favor of Defendants. 13370 were decided by European Judges and 156,526 by Native Judges.

The description or nature of Original Suits instituted for the two years 1865 and 1866 is shown below.

	Connected with land revenue.	Otherwise connected with land.	Houses or other fixed property.	Debts and wages.	Caste, religion, &c.	Indigo, sugar silk, &c.	Total.
1865 - -	5,646	13,395	5,192	141,156	458	2,282	168,129
1866 - -	5,775	13,583	5,530	141,070	416	2,126	168,500

	Appeals Regular and Special.		Original Suits.	
	1865.	1866.	1865.	1866.
For hearing - - -	16,226	17,456	456	533
Disposed of - - -	9,342	10,140	356	449
Pending at close of the year	6,884	7,316	100	84

The aggregate of Appellate Jurisdiction in the various Courts for the same periods will be seen from the annexed statement. The total value of Appeal suits pending at close of each year was 150,828*l.* in 1865, and 201,973*l.* in 1866.

The operations of the High Court on its Original side showed an increase in the suits instituted and disposed of, and a decrease in the number pending at the close of 1866, as compared with that of the year previous. Of the suits disposed of, 292 were decided on merit, against 246 in 1865, and 118 withdrawn; as compared with 82 in the previous year; the remaining suits were dismissed on default.

APPEALS.	1865.		1866.	
	Regular.	Special.	Regular.	Special.
Total appeals for hearing	135	817	142	839
Appeals disposed of - -	87	544	111	660
Pending at close of the year	48	273	31	179

On its Appellate side there was an increase in the number of Appeals for hearing, both regular and special; and in the number of Appeal suits disposed of. The average duration of suits disposed of was three months and one day, while in 1865 it was four months; and the total value of suits pending

at the close of 1866 was 183,766*l.* against 140,112*l.* in the preceding year.

There were also 326 Civil Petitions brought before the High Court, of which 271 were disposed of, against 262 in the previous year.

Of the Criminal Petitions, 215 were presented, 196 of which were disposed of, against 185 in the previous year. Eighty-four trials, in which sentence of death was recorded by the Sessions Court, were referred to the High Court for confirmation. Of these, 71 sentences were confirmed, 10 modified, and three released.

The total number of criminal offences reported and complained of in 1866-67 was 147,291; and 318,522 persons were believed to have been concerned in or were charged with offences; 97,757 cases, or 66·4 per cent., were brought to trial; and 188,854 persons were arrested or summoned to answer accusations. In 77,449, or 79·2 per cent., of the cases tried, 131,252 persons were convicted; and 25,196 cases, 17 per cent. of all charges preferred, went by default, were withdrawn, or were otherwise disposed of. The value of property lost amounted to 132,702*l.*; of which 31,424*l.*, or nearly 25 per cent., was recovered, against 20 per cent. in 1865-66.

The increase in the total number of offences and charges preferred, of 7·7 per cent. as compared with the previous year, was chiefly due to a large increase of offences against property without violence, and to increased action on the part of heads of villages under special laws in regard to petty offences.

Of the number of persons arrested 69 per cent. were punished, against 66 per cent. in 1865-66.

The distress consequent on the prevalence of high prices during the latter part of 1866 produced an increase of crime. In the month of September grain riots occurred in the presidency town of Madras, causing considerable uneasiness to the inhabitants; these disturbances were, however, promptly suppressed.

It is satisfactory to note that whereas the convictions among European offenders amounted to 319 in 1865-66, there were only 197 in 1866-67. A committee had been formed at Madras, with a view of devising some means of checking the increase of European vagrancy, to which allusion was made in last year's report.

Bombay.

	1865-66.	1866-67.
Total appeals for hearing -	1,129	1,107
Appeals disposed of -	795	793
Appeals pending at close of the year - - -	334	314

at the end of 1865-66. In addition to these, there were 923 applications for admission of special Appeals, of which 894 were dealt with during the past year. Of the miscellaneous applications 1,447 were granted and 199 were rejected.

In its original jurisdiction the number of cases instituted was 1,617, as compared with 1,734 in 1865-66; besides which there were 42 and 37 appeals from Courts of the Divisions respectively instituted. The causes disposed of amounted to 1,579 in 1865-66, and 1,552 in the year under review. There were also 1,210 motions and 2,031 Orders in Chambers, against 869 and 1,208 respectively in the previous year. The applications for probate and administration amounted to 667, against 587 in the year 1865-66.

	1865-66.	1866-67.
Number of Suits for hearing	182,441	163,854
Suits disposed of - -	141,912	138,852
Suits pending at close of the year - - -	40,529	25,002

&c. The average duration of time taken in these courts for cases decided was five months and four days.

During the past year an important change had taken place in the judicial administration of Sind. By the passing of Act XII. of 1866 (Bombay) the constitutions of the Courts in that Province have been legalized, and the proceedings of certain officers have been made valid. The judicial functions of the Commissioner have been abolished, and he is now enabled under this Act to appoint Judges of the subordinate Courts, and to prescribe the mode of executing decrees against certain privileged Sirdars.

In all the Civil Courts in Sind, the number of suits on the files, including arrears, was 10,198, and the number decided 9,525; while in the preceding year the corresponding numbers were 11,028 and 10,024 respectively. The value of suits in 1866 was 86,055*l.*, as compared with 55,977*l.* in 1865.

The

The operations of the High Court on its appellate side are exhibited in the comparative statement annexed. The number of appeals, regular and special, on the files for hearing were less than in the previous year; while the actual work disposed of was nearly the same, and those pending at the close of the year were less than

The working of the Civil Courts in the Regulation districts of the Bombay Presidency shows favourably when contrasted with the operations of the previous year. Of the suits decided 11,991 were connected with land against 11,129 in the year preceding; the remaining suits were concerning debts, wages,

The number of appeals filed and in arrears amounted to 347, and the number decided 247, leaving a balance of 100 for the following year; while the appeals pending at close of 1865 were 94.

The following table will exhibit the operation of the Small Cause Court at Bombay during the past two years :

Years.	Number of Suits instituted.	Amounts litigated.	Fees to Credit of Government.	Number of Judgments given.	Amounts received in Cases compromised and decided.	Proportion of the foregoing paid to Suitors.
1865-66	22,362	£ 256,403	£ 25,648	14,483	£ 49,356	£ 48,321
1866-67	22,433	272,881	26,595	14,179	50,770	50,173

from which it will be seen that there has been a considerable increase in the business and receipts of this Court during the 11 months of 1866-67, as compared with 12 months of the previous year. The entire expense was given at 15,372*l.*, which, when deducted from the net receipts shown at 26,595*l.*, left a surplus to credit of the Court of 11,223*l.*

	1865-66.	1866-67.
Number of suits instituted, including arrears -	12,903	13,986
Suits disposed of -	11,516	13,306
Total receipts -	£ 7,896	£ 9,264
Charges for maintaining these Courts -	4,841	5,569
Net receipts -	3,055	3,695

Besides this Court there are four other Small Cause Courts in this Presidency. The receipts in three of which exceeded the cost, namely, Poona, Ahmednugger, and Ahmedabad; but in Belgaum the deficit amounted to 534*l.*, against 249*l.* in the preceding year. The working of these Courts was very satisfactory; for while the business had increased, and a great number of cases disposed of, the balance at the close of the year under review was less than in the previous year.

The average cost of each suit was 16*s.* 3*d.*, and the average duration of each suit was only 24 days.

The creation of the Small Cause Court at Poona has supplied a great want; the number of suits filed in this Court alone was more than was filed in four Moonsiffs' Courts, and therefore supplanted the duty of the latter entirely.

With regard to the Criminal administration of the High Court on its appellate side in Bombay, there were 1,090 cases disposed of, being an increase of 48 over those in 1865-66, and on its original side there were three motions and 131 cases disposed of during the 11 months under review.

There has been also an increase in the number of criminal offences committed throughout the Courts of the Regulation Districts of this Presidency, including the Sessions Courts. Out of 1,290 preliminary inquiries instituted by the Magistrates in these Districts, 807 cases were committed, and 483 were discharged for want of evidence. The largest number of trials was under the head of "hurt," "criminal force," and "assaults;" the increase under these heads having amounted to 1,512. In the convictions of the more serious offences, the increase appeared under the heads of "culpable homicide," "attempts to murder," and "dacoity."

In Sind the criminal offences amounted to 12,938, in which 19,206 persons were more or less concerned, while in 1865, 18,820 persons were brought to trial; the number convicted was, however, 9,164, being 386 less than in the previous year, but those acquitted were considerably more, the numbers being 8,956 in 1865, and 10,042 in 1866. The nature of the increase in crime in Sind was similar to that already mentioned in foregoing paragraph.

Bengal.

Police.

	Total Strength.	Total Cost.
		£
Regular police - -	25,572	420,514
Municipal police and Chow- keydars - -	7,370	53,512
Police employed in military duties - -	665	10,578
Special police for the East Indian Railway - -	747	12,120
Village police - -	188,710	278,555
Total - -	223,064	775,279

The Police Force of Bengal was composed as shewn in the margin. The regular district police is paid entirely out of the Imperial revenues; the municipal police is paid partly by Government and partly from the municipal funds; and the village police, which is appointed by landowners or village communities, is paid in money, in kind, or by assignment of land on conditions of service. During the past year a Bill was introduced legalizing the amalgamation of Municipal Police and Chowkeydars or watch-

men, with the Regular Police in order to reconcile certain discrepancies in the two Acts under which the former class are enrolled. Hence, therefore, the total strength of the Police Force would stand as 32,942 men, at a cost to Government of 474,026*l.*, making the average cost of each policeman about 14*l.* 7*s.* 9*d.* This was considered to be the minimum strength necessary; and indeed some difficulty was experienced, during the pressure caused by the famine, in supplying men for carrying on the extra duties entailed on the Police in the distressed tracts, consequently additional men had to be employed at a cost of 4,939*l.*

After a prolonged correspondence the East Indian Railway Company have been induced, in consequence of the numerous thefts, robberies, and other offences committed on their line, to accept the offer of the Government to place at their disposal an efficient force of police to check such crimes. The Company were to pay three-fourths of the entire cost.

In addition to the extra duties thrown on the Police during the year from

	Cognizable Cases.		Non-cognizable Cases.	
	1865.	1866.	1865.	1866.
Number of cases reported -	63,289	73,118	91,505	78,817
Persons arrested - -	60,124	91,135	38,573	80,003
" convicted and com- mitted - -	31,240	53,602	48,062	43,172
" acquitted - -	18,832	32,025	26,439	32,613
" otherwise disposed of, pending trial, &c. -	10,052	5,608	14,072	4,218

causes already assigned, their general conduct and the other work performed by them has been satisfactory. The accompanying comparative table shows that the total number of cases cognizable and not cognizable by the Police was 151,935, against 154,794 in 1865. This diminution is due to the non-cognizable cases having decreased by 12,688. The total number of convictions was 96,674,

against 79,302 in the preceding year. The greatest number of offences consisted of offences against property, arising from want and famine. Most of the dacoity cases also were grain robberies, committed by starving people in search of food; and the statistics of crime rose and fell according to the price of grain. Where it was ascertained that the commission of many of such offences was attributable to actual pressure from want, Government authorized a mitigation or remission of punishment in every case in which it was proved practicable; but where the crimes had been committed by habitual thieves and robbers, the sentences passed by the Session Courts were not interfered with.

	1865.	1866.
	£	£
Value of property stolen -	91,858	121,899
" recovered	24,192	35,135

The per-centage of recovery of stolen property was 29·31 against 26·33 in 1865.

The Detective department of the Police has been, during the year under review, thoroughly reorganized, at a saving of 516*l.* per annum.

By this new arrangement, which came into effect in April 1867, a certain number of men will be placed under the immediate orders of the Deputy Inspector-General of each circle, for the purpose of being solely employed in investigation of serious crimes, under the direction of the District Superintendents.

In consequence of certain dacoities having been committed, in the Nowadah subdivision of the Behar District, upon travellers and others in the neighbourhood of the Grand Trunk Road, and in the belief that the landholders had been acting in

in collusion with the robbers, Government issued a warning to them and to the villages that a tax would be levied upon them for the maintenance of extra police, for the purpose of suppressing such outbreaks of crime, should the practice be continued. This warning had the effect of putting a stop to the dacoities, which it was feared at the time would be renewed. In the meantime, orders were issued for the strict enforcement of the existing law, declaring the responsibility of landowners for reporting the congregation of bad characters on their estates; and the police officers, as well as the magistrate and his assistants, have been enjoined to visit frequently the vicinities where robberies usually occur. The police outposts will be strengthened, if proved to be necessary, so that patrols may be sent out along the principal passes of the hills.

Allusion was made in last year's Report that the cost of the Calcutta Police would be transferred to the municipality, Act No. VI. of 1867 has accordingly been passed to enable the Justices to raise the necessary taxes in support of the Municipal Police.

The terms of the transfer are, that in consideration of the municipality undertaking to bear all expenses incurred for maintenance of the existing Calcutta Pauper Hospital, the Government would on their part contribute to the cost of Police employed as guards for the Jail and other Public Offices, and one-fourth of the remaining charges, as may be sanctioned by the Government of India in their annual budget estimate.

A less expensive uniform for the Police has been sanctioned, the Native style of dress being preferred to the European.

Years.	Strength of Police Force.
1865	25,989
1866	25,242

The strength of the Police in the North-west provinces was less by 747 than in the year preceding.

North-west Provinces.

Among the changes introduced with the view of promoting efficiency, was the separation of their civil and military duties, without, however, turning the force into two distinct bodies of Police. A certain portion of the

men in each district were to be armed with fire-arms and thoroughly drilled, the larger portion being employed in civil duties only, simply possessing the baton or staff.

The pay of the chowkeydars, or watchmen, has also been increased where practicable, in order to secure a greater efficiency among this class of Police. The substitution of town chowkeydars for municipal constabulary has also been carried out in many of the rural towns; a change which has proved satisfactory both to the people and to the local authorities.

A Government Railway Police has also been organized with the consent of the Railway authorities. This force is under the control of an Assistant Inspector General of Police, but at the absolute disposal of the agent of the Railway Company; it is reported that the scheme has worked successfully, and that the arrangements have proved beneficial both to the Railway company and to the public. The total cost of this force was 9,383*l.* per annum, of which 7,037*l.* was to be paid by the company.

Chief Offences.	1865.	1866.
Murder - - -	325	291
Dacoitee and robbery - -	651	432
Lurking house trespass -	17,727	14,701
Theft, including cattle -	32,028	31,016

A comparison of the principal offences against life and property showed a considerable decrease in crime for 1866. The value of property stolen was 107,088*l.*, against 120,309*l.* in 1865; while the proportion recovered was 35,073*l.*, as against 33,504*l.* in the year preceding.

	1865.	1866.
Number of offences -	65,585	65,413
Offences investigated -	25,057	34,724
Persons brought to trial -	37,038	37,861
Acquitted - - - -	12,860	10,602
Convicted - - - -	22,968	24,672
Died - - - - -	297	222
Under trial - - - -	965	658

Decided improvement in the important matters of investigation and detection appeared to have taken place. While the number of offences was less, the proportion investigated has been considerably greater than last year. Of the number of persons brought to trial 65 per cent. were convicted against 62 per cent. in 1865. The number of deaths has been also less, and those remaining under

trial at the close of the year was likewise less than in 1865.

The general progress of this branch of the Administration was considered satisfactory.

It may be well to remark here that magistrates of districts are beginning to take more interest in police work, and more readily accept their position as chief police officer of the district. As they find district superintendents more ready to recognize their authority, and more willing to work in conjunction with themselves, so the unfortunate antagonism which at one time existed is now disappearing, and the utmost harmony prevails on every side. The effect of this happy state of things cannot but be most beneficial to the Police Administration of this Province.

Central
Provinces.

	1865.		1866.	
	Strength.	Cost.	Strength.	Cost.
		£		£
Regular police - -	7,527	120,666	7,516	123,832
Municipal police - -	1,518	13,693	1,458	13,693
Total - -	9,045	134,359	8,974	137,525

The total strength of the Police in these Provinces has been reduced from what it was in 1865; without, however, leading to a similar result in the cost, owing to the continued dearness of provisions. The Regular Police are paid from the general revenues, and the Municipal Force out of local funds. The cost of each policeman was during the past year about 15*l.* 6*s.* 6*d.* per head. Their general action has been satisfactory, for out of 23,888 offences reported, 12,522, or 52 per cent. of the whole, were investigated by the Police. Of the total number of persons sent up by them for trial 86 per cent. were convicted, 6 per cent. were acquitted, and 8 per cent. were released. The conduct of the Force showed also that an improvement has been made in their general efficiency.

Landholders all over the Central Provinces are becoming more alive to their police responsibilities. The material aid rendered by them in reporting crime is duly acknowledged by nearly all the Magistrates and Police Officers.

Punjab.

	1865.		1866.	
		£		£
Imperial Police - -	15,491	15,568		
Municipal do. - -	3,905	4,809		
Total - -	19,396	20,377		
Cost to Government -	260,000	260,000		
From municipal funds -	34,137	39,556		
Total cost - -	294,137	299,556		

The strength and cost of the Police Force in the Punjab for the last two years is given in the accompanying table. The cost to Government is a fixed annual sum. The proportion to population is given at 1 to 736 souls, and the average cost of each policeman was 14*l.* 14*s.* 0*d.* in 1866, against 15*l.* 3*s.* 3*d.* in the previous year.

The system of registration and surveillance of bad characters and thieving tribes, under the supervision of European officers, has proved

to be of great use, both in the prevention and detection of crime. The efforts of the Police during the past year towards the detection of crime contrast very favourably with the year preceding, and speak well for their efficiency. 67·9 per cent. of cases were brought to trial, against 62·3 per cent. in 1865. The per-centage of acquittals and discharges to arrests was 25·4, against 27·8 in 1865; and 36 per cent. of property stolen was recovered, against 32 per cent. in the previous year. The conduct of the Police Force has also been satisfactory.

Hyderabad
assigned
districts.

	1865.		1866.	
	Cognizable.	Non-cognizable.	Cognizable.	Non-cognizable.
Offences reported -	3,344	1,151	4,160	2,104
Do. brought to trial	2,436	1,904	2,875	2,081
Persons arrested -	4,212	3,659	5,905	3,677
Do. convicted -	2,616	1,691	3,721	1,678
Value of property stolen	£ 16,441		£ 20,115	
Do. recovered -	3,552		5,934	

The efforts made in the assigned districts of Hyderabad towards the detection of crime contrast favourably, as regards the number of cases brought to trial by the Police, in comparison with the number reported to them, being 79·2 per cent. The proportion of convictions to arrests, however, does not appear to be quite so good, only 56·3 per cent. This, so far as it affects the Police, is

explained by the per-centage of acquittals in cases cognizable by them, being 44 per cent. larger in those instances in which they have been taken up by the magistrates on complaint, without police inquiry, than in those in which the police

police have conducted a preliminary investigation. The establishment of village watchmen had been effected during the past year on a fixed footing, and on an advanced pay, by which great improvement in the detection of crime may be expected. The conduct and efficiency of the Police has been generally good; they are still, however, deficient in detection, and lack perseverance in grave crimes.

	1865.		1866.	
	Strength.	Cost.	Strength.	Cost.
		£		£
Regular Police - - -	5,530	112,088	5,693	116,618
Village Police - - -	945	11,340	945	11,340
Municipal Police - - -	523	9,196	569	10,863
Total - - -	6,998	132,624	7,207	138,821

The sanctioned establishment of the Police Force in British Burmah, and its cost, showed a slight increase, when compared with 1865. The cost of each policeman was, in 1865, 18*l.* 19*s.*, and in 1866, 19*l.* 15*s.* 2*d.* The increase in the numbers of the regular constabulary was due to an augmentation in the number required for Port Blair, a penal settlement in the Andaman

British Burmah.

Islands, besides additional men employed on the frontiers of Pegu during the rebellion in Upper Burmah.

Of the whole force 75 per cent. are from the people of the country, and are employed mainly in preventing or detecting crime among their own race; the remainder are natives of India, and are employed at Port Blair, in the seaport and garrison towns, and as guards over jails and treasuries. Among an excitable race like the Burmese an alien Police would never work satisfactorily; and although it is difficult to train a Burman to regularity, or to submit to discipline, he has nevertheless some qualities valuable in a criminal officer.

The average charge of a Native Officer of Police was 201 square miles, and 5,195 of the population: that of an European Officer extended over 1,452 square miles, and 37,459 of the population. The area for each constable employed for the ordinary criminal work of the Province, after deducting those at Port Blair, and those engaged along the frontier, and as guards to jails, treasuries, &c., was 24 square miles; and excluding the municipal population provided for by the municipal police, the working District Police was as 1 to 546 of the district population.

	1865.	1866.
Bailable Offences - -	14,121	14,494
Non-bailable Offences - -	6,631	7,174
Total - - -	20,752	21,668

From the accompanying table it will be seen that non-bailable offences have increased 8 per cent. while the general increase on all offences was 4½ per cent. The population is reported to have increased during the same period 2·17 per cent.

Of the number concerned in non-bailable offences during the year under review 5,117 persons were brought to trial; of which 3,300 persons, or 64 per cent. were convicted or committed; the remainder were acquitted or otherwise disposed of. The average of convictions during the year preceding was 61 per cent. Of the bailable offences committed 31,669 persons were brought to trial; of whom 20,237 persons, or 64 per cent., were convicted. The value of property stolen or plundered amounted to 46,569*l.*, of which 26 per cent. was recovered, while in the previous year it was only 22 per cent. These deductions show an improvement in the exertions of the Police of a satisfactory character.

Heinous Offences.	1865.	1866.
Dacoitee - - -	125	159
Murder - - -	52	52
Robbery - - -	144	173
Housebreaking - -	323	427
Receiving stolen property -	362	474

Considerable increase had taken place in crime under the head of heinous offences; which was found to have been principally in the Prome district, partly assignable to the breaking out of the rebellion in Upper Burmah, and in a measure due to the very high price of food which ruled during the year.

It is satisfactory to note that the serious disorganization of all Government rule, which had for some time existed in Upper Burmah, did not spread into the territories under British administration, although the latter became the refuge of thousands who fled for protection during the anarchy that prevailed.

The conduct of the Police was reported to have been satisfactory during the past year.

Madras.

The total strength of the Police Force in Madras Presidency was, for the eleven months ending 31st March 1867, 24,403, being 1·6 per cent. less than the permanent establishment. Their cost was, for the same period, 334,944*l*. The proportion to the population was 1 to 1,065, in towns 1 to 566, and in rural districts 1 to 1,215, respectively. The average cost per man may be stated at 14*l*. 10*s*., or 3*d*. per head of the population. In addition to the above, there were 783 Mounted and Marine Police for the town of Madras, the cost of which (exclusive of the latter) was 19,013*l*. The receipts realized by the Marine Police fell short of the disbursements, owing to the general stagnation of trade. In previous years these receipts exceeded the disbursements.

Fifty-six per cent. of the whole Force can read and write legibly, and hundreds of men who could neither read nor write on joining the Force now write their own reports.

The Towns Improvement Act (No. X. of 1865) was introduced, during the year under review, into the principal towns throughout the Presidency, and the several municipalities have been paying 75 per cent. of the cost of their Town Police. The exertions of the Police in detecting crime and in arresting persons have been satisfactory. A large increase is noticeable in the loss of life and property by fire as compared with the previous year, and is assignable to the unusually dry season of 1866-67.

Bombay.

	1865-66.	1866-67.
Persons brought to trial -	25,763	18,459
Convicted and punished -	18,584	11,990
Acquitted -	6,877	6,288
Value of property stolen -	£ 26,130	£ 19,754
Do. recovered	9,374	9,400

The number of persons brought before the Police Courts in the town and island of Bombay would naturally be less, considering that the period under review was less by one month than the previous year; but it is reported by the senior Magistrate that, after making every allowance for this abbreviation of the official year, the decrease was still very striking, and was accounted for in a great measure by the diminished demand for labour having kept many of the labouring classes

within their own districts in the country.

Heavy fines had been inflicted, and flogging, instead of imprisonment, had been resorted to during the year.

The proportion of convictions in these Courts was 65 per cent., against 72 per cent. during the preceding year. The value of property stolen was less by 6,376*l*., and the value of property recovered was slightly in excess.

The chief feature in the administration of this Department has been the complete re-organization of the District Force. The salaries of all grades have been raised, and a fund has been formed providing pensions for superannuation. This new arrangement came into operation on the 1st July 1867, and, though yet in its infancy, the character of the Police has greatly improved; and it is hoped that similar changes may yet be effected among the Village Police.

A gang of professional thieves, who have been wandering about in the Province of Gujerat for many years, have nearly been rooted out. It appears, from the evidence of one of them who had enlisted into the Police Force of Ahmedabad, that this gang originally came from Tehree, and other villages in Bundelcund; that it was there assembled, and regularly organized, with a general staff and its subordinate grades. Boys only were in the ranks, who principally committed the thefts. They were never recruited except from their own villages, and allow no women in their bands. The men plan the thefts and dispose of the proceeds; the boys were lent by their parents to those in authority in the gangs on an annual payment. Any information given to outsiders was at the risk of life. This gang has visited Gujerat for 25 years; their thefts were mostly committed in the daytime, seldom after dark, and were generally of a light character, such as snatching and picking pockets, without any attempt at dacoity, poison, housebreaking, or murder. Several of this caste have since been taken into the Police Force, and by their means have greatly helped to exterminate the gang from Ahmedabad and its vicinity.

Similar arrangements have been made with the Railway Companies to those mentioned in the preceding pages for the organization of a railway police, with the view of stopping the numerous thefts and robberies that have been committed on their lines, and with satisfactory results.

In

In the Southern Division of the Bombay Presidency the increase in crime, though not so very great, was assigned to the prevalence of distress among the poorer class, owing to a succession of unfavourable seasons, bad harvests, and a continuance of high prices for the necessaries of life; in consequence of which, and in order to secure a greater efficiency in the working of the police during so critical a period, a gratuity, equal to half a month's pay, was granted to the police in those districts wherein high prices prevailed.

Jails.

	1865.	1866.
Total number of prisoners in custody - - -	90,333	114,870
Number admitted into jails during the year - - -	72,617	95,951
Disposal of prisoners.		
Executed -	70	57
Died in prison -	1,129	2,347
Escaped -	291	457
Released -	55,835	72,922
Remaining in confinement	33,508	39,087
Total - - -	90,333	114,870

	1865.	1866.
Daily average of prisoners -	18,842	22,151
Number sick during the year - - -	29,516	33,531
Number discharged from hospital - - -	27,082	27,680
Number died - - -	1,129	2,347
Number remaining in hospital at end of the year -	970	859

The number of prisoners in custody, Bengal, admitted, and disposed of in 1866, showed an increase under every head except that of capital punishment. The increase in the number admitted was exceptionally high, and was mainly due to the scarcity and to the high price of food, impelling many to commit crimes in order to obtain shelter and sustenance in jails. Owing to the majority of those admitted into Jails during the year being in a diseased and debilitated state from want, and also from the overcrowded state into which the jails were consequently placed, there was an unusual high ratio of deaths to daily average strength of prisoners, which in 1866 was 10·59 per cent. against 5·95 per cent. in 1865, and 7·60 per cent. the average of the previous five years.

To obviate to some extent the evils of overcrowding in jails, the surplus prisoners were employed in out-door work, many being placed at the disposal of magistrates for employment in the cleaning of stations, and re-

moving jungles in their vicinity. Temporary shelter was also erected at some of the large jails, where enclosed available space could be found for sheds.

Measures have been taken towards introducing a better system of education into jails. Hitherto the practice adopted was to employ the educated convicts, at odd hours, as instructors to others; but on the removal of these teachers, either by transfer or release, a complete stop was put to the course of education in that particular jail. Hence, to meet this difficulty, and in order to reduce to a manageable number the convicts receiving instruction, it has been ordered that the privilege of learning to read and write shall be confined to well-conducted prisoners, and that at each jail an educated convict, if possible, or a paid instructor, shall be employed in teaching the elements of vernacular education in a room set apart for the purpose, the expenses being borne by the Convict Labour Fund.

Results of Jail Manufactures.	Eleven-twelfths of 1865-66.	1866-67.
Gross receipts - -	£ 48,983	£ 57,107
Deduct charges - -	29,624	36,817
Net profits - -	19,359	20,290
Net profits of preceding year - -	19,651	19,359
	Decrease. £ 292	Increase. 931

Of the average daily number of prisoners employed in ordinary Jail Manufactures, there were 10,488, as compared with 9,418 in 1865-66. The result of their labours for the eleven months ending 31st March 1867, compared with eleven twelfths of the year preceding, showed an increase in profits, though the average earning of each prisoner was less than in 1865-66, being 1*l.* 18*s.* against 2*l.* 1*s.*

	Eleven-twelfths of 1865-66.	1866-67.
Total expenditure for maintenance of prisoners -	£ 101,005	£ 139,289
Deduct income from all sources - - -	32,283	35,551
Net cost of maintenance -	68,722	103,738

Assuming, as shown above, the daily average of prisoners to be 18,842 in 1865-66, and 22,151 in 1866-67; and the net expenditure incurred by Government in Bengal to be 68,722*l.* and 103,738*l.* respectively, the average cost for the maintenance of each prisoner was 4*l.* 13*s.* 8*d.* against 3*l.* 12*s.* 11*d.* in the year preceding.

North-west
Provinces.

	1865.	1866.
Jail population - -	73,118	77,107
Daily average number of prisoners - -	16,417	16,840
Aggregate expenditure -	76,436 <i>l.</i>	77,561 <i>l.</i>
Average cost of each prisoner - - -	4 <i>l.</i> 15 <i>s.</i> 6 <i>d.</i>	4 <i>l.</i> 14 <i>s.</i> 10 <i>d.</i>

establishments, and to additions and repairs of jails. In consequence of a change in the arrangement of the duties of Police Guards at jails, there was a reduction of 3,000*l.* under the head of "Permanent Guard."

The average earnings of each prisoner engaged in manufactures was in 1865 3*l.* 13*s.* 4*d.*, and 4*l.* 8*s.* 4*d.* in 1866.

There was an increase of 151 in the number of females imprisoned during the year, who were convicted chiefly for theft or receiving stolen property. They were mainly employed in spinning and weaving while in jail, and the system of good-conduct marks has been introduced at all the Central Prisons with good effect.

It is satisfactory to observe, from the care and attention bestowed, that the health of prisoners has been generally good. The death-rate has been about 2½ per cent. Nearly one-fourth of the casualties arose among those admitted into Jails in a bad state of health.

Of the prisoners under confinement 3,270 had learned to read, and 1,452 had learned both to read and write.

There are four Central Jails in the Central Provinces,—at Nagpore, Jubbulpore, Raepore, and Hoshungabad. That at Nagpore was the most advanced, and has been already in occupation; the other three were progressing towards completion. Besides these, there are also nine District Jails, all in good state of repair.

From a daily average of 3,438 prisoners available for work, 1,287 were engaged in building and repairing jails during the year; whereas in 1865, out of a larger number of available prisoners, only 784 were so employed.

The average net cost of each prisoner to the State was 2*l.* 10*s.* in 1865, and 3*l.* 16*s.* in 1866.

The health of prisoners showed an improvement in comparison with the previous year; the per-centage of sick to daily average having fallen from 7·67 to 6·84, and the death rate from 12·15 to 7·44 per cent.

The net profits of the Thuggee School of Industry at Jubbulpore, which was this year placed under the charge of the Inspector-General of Jails, amounted to 2,500*l.*

The number of jails in the Punjab was 27, the same as in previous year; but the extent of accommodation had been increased by the erection of additional wards. Three new jails are in course of construction, and three more have been sanctioned, including one for European prisoners in the Jullundhur district.

	1865.	1866.
Total number of prisoners	31,424	31,578
Daily average number of prisoners - -	10,308	10,292
Total expenditure on jails -	£ 53,467	£ 51,859
Earnings of prisoners -	17,445	17,833

1*l.* 14*s.* 7*d.* and 1*l.* 13*s.* 3*d.* respectively, making thus the net cost of each prisoner 3*l.* 6*s.* 2*d.*, as compared with 3*l.* 10*s.* 4*d.* in the previous year. These are results which may be considered satisfactory. The sanitary state of the prisoners was excellent; the average daily proportion of sick was 2·51 only; and the rate of mortality, calculated on the daily average number in confinement, was less, being 1·78 per cent. contrasted with 3·56 in the preceding year.

The

The conduct and discipline of prisoners was generally very good; no evements of any kind occurred. The following measures had been introduced with a view of regulating discipline on a reformatory system:

The different kinds of labour have been classified into "hard," "medium," and "light," with rules for promotion from one stage to another for good conduct and diligence:

A system of extra-mural labour, without the degrading accompaniments of the old road-working gangs, has been experimentally sanctioned for continued good conduct:

Ticket of leave rules have been partially introduced:

And rules have been prescribed for the appointment of prisoner-guards, work overseers, and ward masters, in recognition of continued good conduct and conspicuous merit.

At the end of the year, out of 9,719 prisoners, 450 could read and write; 2,134 could read only; 7,135 could neither read nor write; and 5,003 were under instruction.

The two jails in course of construction in the Hyderabad assigned districts at Akolah and at Oomrawuttec were gradually approaching completion. Hyderabad assigned districts.

The average number of prisoners was 856, while in 1865 it was 870. Their average cost was 9*l.* 8*s.* 4*d.* against 8*l.* 13*s.* 9*d.* in the previous year, an increase which was partly due to the high prices of food. The conduct of the prisoners was good. They had been employed solely on the construction of jails, which, when finished, will enable their labour to be directed into a more remunerative channel. Only 13 deaths occurred, making the rate of mortality only 1·53 per cent.

	1865-6.	1866-7.
Average daily number of prisoners - -	3,876	3,602
Number of deaths - -	473	393
Gross expenditure - -	£ 22,056	£ 23,847
Earnings by prisoners - -	2,369	4,068
Net cost of prisoners - -	19,687	19,779

In British Burmah there has been a decrease in the average daily number of prisoners to the extent of 274, and a falling-off in the number of deaths of 80; reducing the per-centage, therefore, from 12·29 to 10·8 in the past year. An unusual mortality from contagious fever prevailed in the Rangoon Central Jail, hitherto the healthiest jail in the Burmese Province. The decrease in the number of prisoners was principally among those in custody at Moulmein. The measures taken, however, to eradicate this epidemic were most successful, for at the end of

British Burmah.

the year under review the whole body of prisoners (nearly 1,000 strong) recovered their good health. At Kyouk Phyoo also the rate of mortality became at one time heavy, but steps were taken with due promptitude for improving the health of the prisoners.

The cost of the maintenance of the Jails has increased by the sum of 1,791*l.*, arising from an additional outlay for Establishments, and for extra rations to prisoners in the Jail at Rangoon. The average cost of each prisoner was 5*l.* 13*s.* 4*d.* in 1865, and 6*l.* 12*s.* 4*d.* in 1866. But if from the gross expenditure the earnings of the prisoners be deducted, the net cost of each prisoner will be reduced to 5*l.* 9*s.* 9*d.* for the past year.

	1865-66.	1866-67.
Daily average number of prisoners in confinement.	8,150	9,808
Total expenses incurred -	£ 48,694	£ 72,996

The accompanying table shows an increase in the number of prisoners confined in the jails of the Madras Presidency, and also in the expense incurred; arising from the scarcity which prevailed in Ganjam, Kurnool, Bellary, and Cuddapah districts, compelling many to commit offences with

Madras.

the object of securing refuge in jails. Of the expense (72,996*l.*) incurred, 49,641*l.* was for their food, including extras for the sick. The cost of each prisoner was about 7*l.* 10*s.*, against 5*l.* 12*s.* in the preceding year. In 1865-66 the rate of mortality in jails was nearly 13 per cent., but in 1866-67 it fell to 11½ per cent. Although the difference between the death rates of the two years has been small there has been an improvement in the general health of prisoners; the per-centage of deaths to strength was 76. The discipline maintained in the prisons of this Presidency was good, and the conduct of the prisoners was satisfactory.

Manufactures are now taught in many of the jails throughout the Presidency, the sale proceeds of which, after deducting cost of raw material, amounted to 1,977*l*.

At Vizagapatam, Vellore, and Madura, new jails were in progress during the year. Four blocks of radial cells had been finished and occupied in the Rajahmundry Central Jail; besides several improvements had been made to existing jails elsewhere. Many of the convicts having been placed at disposal of the officers of the Public Works Departments, towards their construction, as well as aiding in making roads, quarrying stone, brick-making, &c.

Bombay.

	1865-66.	1866-67.
Number of prisoners received, and at the close of previous year	30,921	23,972
Daily average number	8,347	6,388

The number of prisoners, criminal and civil, confined in the jails throughout the Bombay Presidency and in Sind was less by 6,949 than in the preceding year, and the daily average number decreased by 1,959.

The financial results of the employment of prisoners in jails showed a net profit of 5,934*l*., against 4,594*l*. in 1865-66, being an increase of 1,340*l*. And the average earning of each prisoner employed amounted to 4*l*. 3*s*., as compared with 3*l*. 3*s*. 6*d*. in the previous year.

	1865-66.	1866-67.
	£	£
Gross cost of maintenance -	69,673	56,400
Less value of labour -	15,298	16,200
Net cost of maintenance -	54,375	40,200

The accompanying table shows satisfactorily a decrease in expenditure towards the maintenance of prisoners. The net cost of each prisoner having been 6*l*. 8*s*. against 8*l*. 7*s*. 6*d*. in the previous year.

In the mortality among prisoners there has also been a considerable decrease. In 1865-66 the deaths amounted to 651, as

compared with 339 during the year under report; of these, 91 deaths occurred in Sind. The ratio per cent. decreased from 10·04 to 5·40 in 1866-67.

Out of 15,612 criminal prisoners received into the jails only 236 were able to read, 830 to read and write, and 119 fairly educated; the remainder were totally ignorant. The practice of conveying instruction in jails by means of convict teachers is being introduced.

Military.

The effective strength of the Army in India as it stood on the 1st April 1867 was 190,957; of this number 64,109 were Europeans, and 126,848 were Natives. The military force of Bengal amounted to 105,505 men; of Madras to 47,654; and of Bombay to 37,798 men.

Europeans.	1865.	1866.
Average strength - - -	64,405	59,941
Admissions into hospital -	102,619	83,128
Deaths - - -	1,585	1,074
Invalided - - -	2,804	2,128
Natives.		
Average strength - - -	94,386	99,036
Admissions into hospital -	116,666	104,666
Deaths - - -	1,866	1,146
Invalided - - -	2,108	1,778

The accompanying statement exhibits the sickness and mortality among European and Native troops in British India during the year ended 31st December 1866, as compared with the similar period of 1865. The contrast appears very favourable, inasmuch as fewer Europeans were received into the hospitals, and there was a decrease in the number of deaths during the past year. Among the Native troops also, while the average strength was greater, yet the number of those admitted into hospitals, and of those who died, was considerably less than in the previous

year. A comparison of the number invalided among Europeans and Natives ought not strictly to be taken into consideration, as the number among Madras troops has not been returned for the past year.

Allusion having been made in last year's Report (page 46) to the subject of the claims of officers to compensation for money contributed by them towards purchasing the retirement of their seniors, consequent to the changes effected in the organisation of the Army in India, it will be sufficient to state here, that the committee appointed to consider the relative merits of each officer's claim are still sitting in India, and have already in some instances granted compensation to such officers as have been found to be entitled to receive the bonus sanctioned under the instructions issued by Her Majesty's Government.

The

The Volunteer movement, also mentioned in last year's Report, has been somewhat checked in Assam, owing to the recent failures in tea. In consequence of the dissolution of the Cachar mounted Volunteer Corps, Government issued instructions for the return into store of all arms and accoutrements supplied.

The special committee appointed to consider the subject of sanitation in military cantonments in Bengal have now brought their labours to a close, by compiling an uniform code of rules, which has been confirmed by the Government of India; these rules came into operation in May 1867.

Revised cantonment rules, under the Cantonment Act, have been introduced into the military stations of Kamptee, Jubbulpore, and Saugor. Lock hospitals have been open during the past year at these places, and the strict observance of their rules have already produced a good effect upon the health of the troops in the Central Provinces.; cantonment committees had also been formed, with sufficient funds at their disposal to carry out all measures of sanitary improvement.

Exceptional measures of relief had been granted to Commissariat contractors at certain stations in the Madras Presidency during the past year, in consequence of their being unable to fulfil their engagements, arising from a failure in the crops, and the unprecedented high prices of the necessaries of life.

During the period of the famine in Orissa, measures were taken for importing supplies of grain for the use of the troops employed in that locality during the emergency, as well as for the registered camp followers and pensioners; in addition to which a temporary famine allowance had been granted to Commissariat and Hospital servants, and to Store Lascars.

The unusual sickness that prevailed at Jubbulpore among Her Majesty's 23rd Regiment of Fusiliers during the year 1866-67 attracted the attention of Her Majesty's Government, at whose request a full inquiry had been instituted, from which it appeared that the causes were primarily a predisposition on the part of the men of that regiment to take the fever, inasmuch as the Artillery quartered with that regiment did not suffer to any proportionate extent; moreover, the 23rd Regiment had marched from Agra, the climate of which is much drier and hotter than at Jubbulpore, which is surrounded by marshy ground, and had to be placed in barracks of a temporary character, having been erected subsequent to the Mutiny, though in occupation ever since. A question also was raised as to the use of quinine as a prophylactic.

The attention of the Public Works Department had been drawn to the necessity of more effectually draining the marshy nature of the vicinity of Jubbulpore, and a special committee was appointed to consider the advisability of constructing entirely new barrack accommodation, and of the best possible site for the same. In the meantime every effort was made to make the existing barracks as healthy and comfortable as possible.

There being much divided opinion as to the use of the quinine as a prophylactic, experiments were ordered to be tried at Peshawur, but the result was not satisfactory. The Government of India have accordingly approved the proposal of the Inspector General of Her Majesty's British Hospitals, that the exhibition of the drug as a prophylactic, when recommended by regimental surgeons, be left to the discretion of Deputy Inspectors General of Hospitals, who will be best able to form an opinion as to the propriety of each application, thus affording at the same time an additional security to the men of the issue of this medicine when really needed, and avoid unnecessary expense to the State.

With a view to improve the condition of non-commissioned officers and soldiers of the British Army liable to serve in all parts of the world, a Royal warrant was issued in June 1867, by which an increase of twopence a day was granted to the several rates of daily pay assigned by the warrant of February 1866; and an additional penny a day was at the same time granted to all men who shall have completed a first period of service, as a special inducement to soldiers to re-engage for a further period of service, and towards encouraging recruiting generally in the Army.

The rates of pay received by British soldiers serving in India, are higher than those granted to soldiers belonging to regiments in this country; but, in consideration of the great increase which has occurred of late years in the prices of many articles of consumption in India, Her Majesty's Government, being desirous that soldiers serving in India should participate in the benefits conferred on their comrades serving elsewhere, have issued instructions for an extension of similar privileges to regiments serving in that part of the world. The increased rates took effect from the 1st April 1867.

In anticipation of an early return to England, at the expiration of their period of service, of some of the new line regiments which had volunteered for general service at the time of the amalgamation of the Indian Army, and in the probable event of some of the officers of these non-purchasing regiments being desirous of continuing their services in India by exchanging into other of the new line regiments, Her Majesty's Government, in accordance with the sentiments of His Royal Highness the Field Marshal Commanding-in-Chief, have resolved on rescinding the order under which forfeiture of all claims to Indian pensions was involved in exchanges between officers of these regiments; and notification has accordingly been issued to all officers concerned.

It has been determined, on the strong recommendation of the Government of India, that in future the appointment of Judge Advocate General in Bengal shall be held by a barrister, who will be selected by the Secretary of State for this important office, with a salary sufficient to secure the services of a gentleman of high professional character and attainments.

Her Majesty's Government, with the concurrence of His Royal Highness the Field Marshal Commanding-in-Chief, have, at the instigation of the Government of India, agreed to restore the old number of colonels allowances to the officers of the Indian Ordnance cadres, on the understanding that no increase will be made to the establishment of colonels commandant, and that the officers succeeding to such colonels allowance will be subject to the rule already laid down by Sir Charles Wood when Secretary of State in 1861. This concession has been made in consideration of the long series of distinguished services performed by the Royal (late Indian) Artillery.

For some time past Her Majesty's Government have had under consideration the subject of an Overland Transport Service, as a better mode of conveying troops between England and India, and, with the view, therefore, of making such an arrangement complete, they have now built five large steamers for the Transport Service, three of which will ply between Suez and Bombay, and two for the European side of the Isthmus between this country and Alexandria. All the vessels have been commissioned, officered, and manned on the footing of the Royal Navy, and under the control of the Admiralty. In order to give full employment to these vessels, those on the European side of Egypt will be at the disposal of the Admiralty during two fifths of the year, and for three fifths of the year the steamers employed on the other side will be at the disposal of the Government of India. It has been decided, moreover, that none but officers and others entitled to passages at the public expense are to be admitted as passengers on board Her Majesty's Indian Troop Ships (as they are entitled), while employed in the conveyance of troops between this country and India. This service commenced its operations in September 1867, and has worked very satisfactorily.

A new cantonment has been sanctioned at Colaba for the whole of the garrison of Bombay, including the Native Regiments. The Sanitary Commissioners have reported favourably of the proposed scheme, and the construction of the necessary barracks will be proceeded with so soon as the plans and estimates have been approved of by the Government of India.

Gas has been introduced into the present barracks at Colaba, but at Poona and Kirkee it was not found to be so feasible, owing to the temporary nature of the accommodation and scattered distribution of the barracks.

Employment has been found for the wives of soldiers in making up clothing, whereby they are enabled to earn from 9d. to 1s. a day. An English school has also been established in each Native Regiment, for the instruction of the children of Sepoys.

The following decisions affecting the interests of subscribers to the several Indian Military Funds, which were transferred to the Government in September 1866, have been passed during the past year.

On the absorption of the estimated surplus balance of the Madras Military Fund, the subjoined concessions were granted to subscribers and annuitants, viz. :—

The reduction of the extra donation for daughters, from Rupees 282 to Rupees 200.

The reduction to bachelor's rates of the donations of widowers with offspring.

The abolition of all demands on account of minimum.

The reversion of daughters, born subsequently to 7th June 1867, to their pensions, on becoming widows.

And the addition of 8 per cent. to the pensions of widows.

The benefit conceded to officers transferred from the Indian to the British Military Forces, of continuing to subscribe at English or Indian rates, according to receipt of pay, has been extended to officers resigning the Indian Service in order to take up paymasterships in the British Army.

It has been ruled by the Secretary of State, that the donation in the rank of colonel was not to be demanded from officers of the Staff Corps, in which substantive rank of colonel does not exist, until they are in receipt of colonels allowances. Colonels of artillery and engineers holding the substantive rank aforesaid are not to be affected by this decision.

The transfer of the Bengal Medical Retiring Fund, under Act 29 Vict. c. 18., was effected in India and in England on the 1st March 1868; and arrangements have been made for the transfer of the Bombay Medical Retiring Fund on the 1st May 1868.

POLITICAL.

The levy of Nuzzerana (or fees on succession) is a subject which has engaged the attention of the Government for a number of years past. Hitherto no definite system existed, nor had any general rules or regulations been framed by the Government of India for the guidance of their officers. With a view, however, to ensure uniformity of practice for the future, a code of rules has been framed applicable to all conditions of succession, without introducing any fresh stipulations likely to interfere with existing engagements. Nuzzerana.

Official intelligence has reached this country announcing the death, on the 27th March last, of his Highness Krishna Raj Wodiar Bahadoor, Maharajah of Mysore, and Knight Grand Commander of the most Exalted Order of the Star of India. By this event the British Government loses an ally whose friendship has lasted for more than half a century. The Government of India lost no time in issuing a proclamation acknowledging his Highness Chamrajend Wodiar Bahadoor, the adopted son of the late Maharajah, as his successor, and as ruler of the Mysore territories. During his minority this Province will be administered, in the name of the Prince, by the British Government, on the same principles and under the same regulations as heretofore, until his Highness shall have attained his majority, when, if he be found qualified for the discharge of the duties of his exalted position, the government of these territories will be entrusted to him, subject to such conditions as may be determined at that time. All persons who were dependent on the late Maharajah will receive full consideration according to their several positions, and were assured of the protection of the Mysore Government. Mysore.

In token of respect for the memory of the late Prince, all public offices throughout the Province were ordered by the Commissioner to be closed, except for urgent business, for the space of three days.

In October 1866 a party of Muniories, under Gokul Sing, a son of the Ex-Rajah of Muniore, made a raid into that country from Cachar, but they were pursued and dispersed by a police force. To prevent such outrages, the Muniories who had been implicated in this and similar attacks were forbidden to remain in Cachar or the vicinity of Muniore; the out-posts at Jirighat and Godown Ghat on the Muniore frontier were permanently occupied by the British police; and a proposal was made to the Rajah of Muniore that a strong police guard, to be paid by him, should be posted on the Kalla Naga Hill, which commands the easiest access from Cachar into Muniore. Measures have also been taken for strictly enforcing the provisions of the Arms Act in the neighbourhood, by prohibiting the manufacture or sale of arms and ammunition by persons who have not received a license to transport them, and exercising great caution in the grant of such licenses. N. E. Frontier.

The illness of the officer entrusted with the conduct of the arrangements for suppressing the raids of the Nagas, as described in last year's report (page 38), has hitherto prevented the carrying out of the new line of policy. Another inroad was committed in June 1866, in which 26 people were killed; and, owing to timely notice not having been given to the police, the marauders made their escape. The Deputy Commissioner has been empowered to proceed summarily against any village proved to have been concerned in a gross outrage, on the understanding that this power is to be exercised only in cases where it would defeat the object of remedial action to refer it for the prior sanction of higher

authority. Orders have also been given for opening out the roads urgently required for facilitating communication between Samoogooting, Dhemapore, and the sub-divisional station of Golahghat.

In furtherance of the scheme described in the preceding report (page 38) of placing a special officer in charge of the Garrow Hills, they have been separated from the district of Gawalparah, and formed into a distinct jurisdiction under a first-class Assistant Commissioner; and some administrative changes have been sanctioned, by which the police and revenue responsibility in each village or tract may be made to rest with one headman. Measures were also taken to open out communications.

At the annual meeting with the Abor chiefs, an agreement was made with the 14 clans of the Bor Abor tribes, who had hitherto kept apart from all intercourse with our officers. The only tribe which still maintains an unfriendly attitude is the Pashre Meyong Abors, and it is hoped that they will not long hold aloof.

In order to gain an accurate knowledge of the different tribes inhabiting the confines of Akyab and Chittagong, and to increase the means of protecting our villages from future attacks, an officer has been appointed Superintendent of the Arracan Hill tracts. The result has been so far satisfactory that there has been no fresh Shindoo raid during the year.

A series of inroads was, however, committed in these tracts by the Looshai Kookies of the Howlong tribe, which had hitherto made no incursions in this direction. It was at first intended to send a force to punish them; but as no expedition would be likely to prove effectual against this tribe (which numbers 16,000 men), unless conducted by a regularly equipped military force, the only measure sanctioned for the present was to raise the police to its full strength, and it was directed that all attempts at dacoity should be repelled, the marauders being followed only where it could be done with safety.

Endeavours were, in the meantime, being made to discover why the measures for the pacification of the frontier have hitherto proved unsuccessful; and also to induce the Looshai and Syloo chiefs to enter into engagements similar to those which have been made with other tribes.

For the administration of the Dooars ceded by Bootan, a new division has been formed, under the title of the Cooch Behar division, which, besides that territory, comprises the subdivision of Titalyah, the districts of Darjeeling, Gawalparah, and the Garrow Hills, and the Native State of Cooch Behar, so long as it may remain under British management.

During the year 1866 the Rajah of Makrai, a feudatory chief of the Nerbudda country, died; he has been succeeded by his adopted heir, a youth aged 16, and well disposed.

Jug Shahai, Rajah of Phuljhur, also died during the same period; but his successor had not been decided upon. This chieftain was one of the most important non-feudatory chiefs of the Mahanuddy Valley.

Rajpootana has been during the year the scene of bloodshed of a very serious character, which has led to the deposition of the Nawab of Tonk, under the following circumstances. The Thakoor of Lawa was invited by the Nawab to his capital, and was there placed in confinement, and his uncle and minister, Rewut Sing, together with 15 other persons, were all foully murdered in the house of the confidential minister of the Nawab of Tonk. Doubts were entertained at first as to the extent of complicity on the part of the Nawab; but from subsequent inquiries it was made clear that he had been a party to the assassination. As a mark of displeasure, the Government of India deposed the Nawab, assigning him an allowance, with a place of residence, and nominating his youthful son in his place, during whose minority the administration of affairs is to be conducted by a Council of Regency, under the superintendence of a British officer. Sarwar Shah, the minister at whose house the murder took place, was to be confined for life as a political prisoner. The Thakoor of Lawa will no longer be subject to the Tonk state, but will be placed under the control of the political agency of Jeypore. Pensions payable out of the revenues of Tonk will be granted to the heirs of the murdered people; and the salute hitherto rendered to the ruler of this State will be reduced from 17 to 11 guns.

An important question has been raised in connexion with the construction of railways passing through Native States, in consequence of the Maharajah Holkar having levied excessive duties on the transit through his territories of merchandise intended for transport by railway. It has been suggested that

if

Central Pro-
vinces.

Tonk.

Indoor.

if concessions for railway undertakings, injurious to the finances of any Native State, are required, some corresponding advantage should be granted to reconcile the chief to any loss he has sustained.

The administration of affairs in Bhawalpore (see last year's report at page 40) made most satisfactory progress. Civil and criminal courts have been established; a police force has been organized; and the diminution in crime, both in this State and the adjacent districts, has been very marked in consequence. Considerable reductions have taken place in the transit and import duties, which were very oppressive; the wasteful expenditure of the Commissariat Department has been also checked; and the accounts of Revenue and Expenditure brought into something like order; attention has been likewise paid to irrigation with more effect, and a system of forest conservancy has been organized; a school has been opened, and measures taken for establishing dispensaries in the larger towns. As might be expected, some few of the old officials, who find themselves debarred from the illicit gains enjoyed under the lax rule of the Nawab, cavil at the existing state of things; but all the respectable portion of the nobility and upper classes, and the mass of the people, fully appreciate the comforts conferred by the changes in administration, and as the best practical test of the feelings of the people, it may be mentioned, that old proprietors were rapidly returning to lands which they had abandoned, and applications for new grants were made in such large numbers that in one sub-division alone, 100,000 acres of land had been leased out to new cultivators during 1866-67. Bhawalpore.

Reliable intelligence has been received of the death from fever of Feroze Shah, (the rebel son of the ex-King of Delhi), at Bokhara, where he is said to have received a compassionate allowance from the Ameer. Punjab.

In 1864 the Maharajah of Cashmere considerably reduced the rates of duty leviable on merchandise entering his territory; a measure which resulted in a large increase in the trade between that country and the adjacent districts of British territory. Recently, however, complaints were received by the Punjab Government that at Ladakh, a noted emporium for the trade between British territory and Eastern Turkistan, the revised rates of tariff were not duly observed, and that exactions detrimental to trade were still practised by the officials of the Maharajah. His Highness was accordingly addressed upon the subject; but the result not being satisfactory, the Punjab Government recommended, and the Government of India sanctioned, as an experimental measure, the deputation of an English officer to Ladakh, for the purpose of seeing that the tariff of 1864 is fully adhered to, and of collecting information regarding the progress of events in Eastern Turkistan, and the prospects of developing commercial relations with those countries. The presence of this officer has already led to a further reduction of duties, and has increased in a marked degree the confidence of British traders. Her Majesty's Government have now decided that the deputation of a British officer to Ladakh shall be made every season, with the full understanding that he is to abstain from any course of action calculated to give offence to the rulers of Cashmere and other foreign territories adjoining. The Maharajah has since evinced his good feeling towards the British Government, by placing at the disposal of the Lieutenant Governor of the Punjab a sum equivalent to between 6,000*l.* and 7,000*l.*, for the promotion of literature and science in that Province. In imitation of this good example, the Rajah of Khupoortullah has contributed 1,000*l.* for the same purpose. Cashmere.

During the past year a survey was commenced, with the view of ascertaining the best practicable route for the construction of a railway from Rangoon to Western China, the operations for which were confined to an examination of the country lying between that town and the north-east portion of British Burmah. No serious obstacles by this route appear to have been met with within British territory. The question of extending the survey beyond the frontier having been referred to the authorities at home, it has been decided by the Government of India to suspend all further operations for the present, as the prosecution of such an enterprise, in the existing state of affairs, might probably lead to political embarrassment, and create complications with Burmah. Burmah.

With a view to regulate commercial relations with the Burmese State, Colonel Fytche was appointed on a mission to Mandalay; which resulted in a revised treaty being satisfactorily concluded on the 25th October 1867, between

the British Government and the Government of Burmah. The provisions of the treaty appear to be such as to conduce materially to the interests of the two countries.

Travancore.

Steady progress has been made in the administration of both civil and criminal justice in Travancore, and continued improvement appears in the efficiency of police operations; the great increase which would have been entailed by the raising of their salaries has prevented the adoption of a measure, the importance of which, with a view to their better organization, has been fully recognised.

The enfranchisement of the Crown lands of the State, to which allusion was made in last year's report (page 42), has produced most beneficial results, and extensive sales have consequently taken place. All compulsory labour in the working of forests has been done away with. An experiment is being made of planting chinchona trees in different parts of the forests.

Satisfactory progress still continues to be made in education. A higher or collegiate branch of the high school had been established under a gentleman from the Edinburgh University; a preparatory branch attached to the high school has been proposed to meet the continued demand for education; besides arrangements for the instruction of females of the higher classes, a general school is about to be formed, under the superintendence of a lady from England, whose services have already been engaged for this purpose.

The vigorous prosecution of public works in different parts of this territory greatly mitigated the distress experienced in the past season of scarcity.

His Highness the Maharajah was, in February 1867, invested as a Knight Grand Commander of the Order of the Star of India, and his Highness's Dewan, Madava Rao, was at the same time made a Knight Commander of the same order, for his valuable administration of the affairs of this State.

Cochin.

Improvement has been made in the High Court of Appeal by the appointment of a qualified First Judge. Additional steps have been taken for the improvement of the other Courts. The scale of punishments laid down for offences under the Penal Code has been adopted in Criminal Courts, and the jurisdiction of the Moonsiffs has been extended as in Travancore. It is in contemplation to enlarge and improve the jail accommodation. Education continues to make satisfactory progress.

Carnatic.

The long pending question as to the claim of Mahomed Ali Khan, better known as Azeem Jah, to the throne of the Carnatic, by right of inheritance, may be now considered settled; Azeem Jah having consented to renounce all pretensions to the Musnud of the Carnatic. A settlement of the case has been undertaken by Her Majesty's Government, the principal terms of which, as accepted by him, are as follows :—

That the title of Prince of Arcot be conferred upon His Highness Azeem Jah, and on successive representatives of the head of the Arcot family;

That he be allowed a salute of 15 guns, to cease at his death;

That his allowance be increased from 15,000*l.* to 30,000*l.* a year, of which one half be continued to his successors in perpetuity;

And with the view of enabling him to maintain his position, a commission be appointed to inquire into the liabilities incurred by his Highness while he acted as Regent during the minority of the late Nawab Mahomed Ghous, for the settlement of which a sum not exceeding 150,000*l.* be set apart.

The proceedings of this Commission are not yet concluded.

Kolapoor.

By the untimely decease during the past year of the Rajah of Kolapoor, this Native State loses an enlightened ruler and the British Government a firm friend.

In consequence of the youth of his successor by adoption, this State has been placed under British superintendence, and measures have been taken for the suitable education of His Highness, who is reported to be a young man of considerable promise. The satisfactory condition of the finances will admit of many works of improvement being carried out during the minority of the present Rajah, and the revenue survey will be completed.

Inchulkurrunjee and five other estates, in consequence of the youth of the Chiefs, are also under British management. The affairs of two principal States in Kolapoor (Vishalghur and Bowra) have been satisfactorily conducted by their respective Chiefs during the past year.

Kattywar.

In Kattywar, bodies of outlaws, under Wagheer leaders, continued their depredations, but in greatly diminished numbers. The Thakoor of Veerpore entertained some of these bands, and, the offence having been brought home to him, his estate has been placed under attachment.

Other

Other Chiefs, however, have shown creditable endeavours to persevere in a course of progress. The Nawab of Joonaghur, the Jam of Nowanuggur, and several other minor Chiefs, have been occupied during 1866 with works of improvement in their respective jurisdictions. Postal communication has received attention, and receipts from this source have largely increased; 34 new schools have been established, with 2,275 pupils in excess of 1865.

An engagement took place in December 1867 between one of these Wagheer bands, consisting of 26 men, under their noted leader Dewa Manek, and a Native force commanded by European officers, with a portion of the Nowanuggur Police, which resulted in the death of the Wagheer leader and 16 of his followers; only 7 of the whole escaped. But it is much regretted that this success should have been gained at the cost of the lives of two most able and zealous officers (Captains Hibbert and Latouche), through the cowardice displayed by the Native Police, whose conduct has been brought to the notice of the Jam of Nowanuggur.

In Kutch the leading event of the year was the birth of an heir to his Highness the Rao, which, according to practice, was the occasion of a general amnesty among prisoners in jails, though protested against by the Political Agent. The revenue administration of the province has been successful, and further progress has been made in education by the opening of an additional school for girls. Important judicial reforms have been promised by the Rao, and for the attainment of this object his Highness has secured the services of a trained Native judicial officer, who will also be his minister. Cholera made its appearance during the year, but, owing to the measures adopted by the Durbar, it was confined to a small compass, and the deaths were comparatively few. The prices of grain and other necessaries continued high.

Kutch.

Bheema Naik, who had for a long time disturbed the peace of the Sautpoora Hills, and had successfully evaded arrest, was apprehended in the Burwanee State during the past year.

Khandeish.

The question relating to the provision of the ex-Ameers of Scinde and their families has at length been finally settled. Allowances have been granted to the various persons entitled to consideration; but no grants of land were to be made under any circumstances; and, on the death of any such pensioner, the continuance or otherwise of the allowances thus lapsing to Government will be considered on the merits of each individual case.

Scinde.

REVENUE.

LAND REVENUE.	1865-66.	Eleven twelfths of 1865-66.	1866-67.
Number of Estates - - -	225,145	206,383	225,747
	£	£	£
Total Demand - - -	4,137,188	3,792,422	3,646,638
Collections - - -	3,755,451	3,442,497	3,341,987
Remissions - - -	31,520	23,893	11,672
Balances - - -	350,217	346,032	292,979
Advance Payments - - -	20,443	18,740	44,287

The annexed statement shows the Demands, Collections, Remissions, Balances, and Advance Payments on account of Land Revenue for the official year 1866-67 as compared with 1865-66. The falling off in the Collections was principally in the Cuttack Division, and attributable to special causes. The Remissions and Balances were less than in the preceding year, while on the other hand the Advance payments were greater.

Bengal.

CUSTOMS.	1865-66.	Eleven twelfths of 1865-66.	1866-67.
	£	£	£
Gross Collections from Merchandise - - -	937,928	859,767	858,165
Receipts on Salt - - -	1,956,559	1,802,679	1,771,854
Total Receipts, including Wharf-rent, &c. - - -	2,922,613	2,679,061	2,643,897
Deduct Refund Drawbacks and Charges - - -	156,286	143,262	97,899
Net Revenue - - -	2,766,327	2,535,799	2,545,998

The entire revenue from Customs is shown in the margin for the same period. The net revenue showing an increase of 10,199%, over eleven twelfths of the previous year. The gross Collection in Calcutta amounted to 2,575,931%, as compared with 2,645,842% in 1865-66, showing a decrease amounting to 69,911%.

The Government of India ordered a thorough revision of the Tariffs of Valuation throughout the whole of

India; a Committee was appointed, and on receipt of their report Act XVII. of 1867 (156.)

was passed, by which the export duty on Grain of all kinds has been raised from two to three annas per maund, or 3*d.* to 4½*d.* for every 82 lbs. The export duty on Saltpetre, and the import duty on all Machinery, have been removed, while the import duty on Sparkling Wines and Liqueurs has been raised to 3*s.* per Imperial gallon.

SALT.	Eleven twelfths of 1865-66.	1866-67.
	Lbs.	Lbs.
Government Salt - -	27,130,148	147,658,384
Excise Salt - - -	581,134	145,304
Imported Salt - - -	452,520,956	452,943,482
Total - - -	480,232,238	600,747,170

The total quantity of Salt cleared amounted to 600,747,170 lbs., exceeding by 120,514,932 lbs. the quantity cleared in the previous year. The net revenue amounted in the past year to 2,518,577*l.*, while in 1865-66 it was 2,198,449*l.*, showing an increase of 320,128*l.*, mainly attributable to the increased sales effected of Government Salt, and to a slight increase in the duty realised from im-

ported Salt, while the charges debitable to the latter had decreased by about 8 per cent. An Amendment of the Salt Law was under consideration of the Legislative Council at the close of the year under review, with the object of enabling all classes of Magistrates to try Salt cases.

OPIUM.	1865-66 (Eleven Months).	1866-67 (Eleven Months).
	£	£
Gross Receipts - - -	5,857,718	4,944,014
Gross Charges - - -	1,733,427	1,269,660
Net Revenue - - -	4,124,291	3,674,354

The net revenue derived from Opium was 3,674,354*l.*, which, when compared with eleven twelfths of the previous year, showed a decrease of 449,937*l.* The aggregate decrease of revenue, including the reduction under the head of Abkarree, amounted to 454,657*l.*

OPIUM.	1865-66 (Eleven Months).	1866-67 (Eleven Months).
	£	£
Chests sold - - -	51,343	38,680
Amount realized - -	5,461,124	4,823,313

A similar comparison of the number and value of chests sold showed a decrease of 12,663 chests, with a value of 637,811*l.* In order to meet the requirements of revenue from this source, the Opium Agents at Behar and Benares have been authorized to extend the cultivation of Opium from 700,000 to 750,000 acres.

The main cause of the decrease of net revenue for the year in question is assignable to the same reason given in last year's report; namely, the reduced condition of the people, arising from the scarcity of food felt in so many districts.

The increase in the charges of Collection which was noticed in the Report of last year is assignable to similar causes, it having been found impossible to reduce the expenditure incurred in the collection of Excise and Income Tax together, in proportion to the revenue lost by the abandonment of the latter impost. The per-centage under this head had risen during the year under review from 6.5 to 7.8.

The revenue derived from sale of Stamps showed an increase over eleven twelfths of 1865-66 of 3,630*l.*; and of 355,623*l.* as compared with 1851-52, while the comparison with 1861-62 showed a decrease of 42,004*l.*

The expediency of revising the Stamp fees in judicial proceedings having been brought to the consideration of the Government of India, Act XXVI of 1867, was accordingly passed with this object.

The average amount of rain-fall was nearly four inches more than in the year preceding. The harvests on the whole were fair, though in certain districts not quite up to the average, and in one part a partial failure of the crops occurred from the want of early rain.

LAND REVENUE.	1865-66.	1866-67.
	£	£
Demand - - -	3,904,875	3,907,448
Collections - - -	3,836,393	3,849,812
Balance - - -	68,482	57,636

The Demand and Collection of Land Revenue both showed an increase, while the balance exhibited a decrease as compared with the previous year.

The outstanding Balances, which amounted to 546,679*l.* in 1863-64, have been reduced to 125,070*l.* in 1866-67;

thus showing a gradual decrease during the last three years.

The number of Suits under the Rent Laws has again increased, there having been 64,935 suits against 60,813 in 1865-66.

The principles on which the permanent settlement of the Land Revenue of Estates effected by Canal irrigation is to be carried out have been under the consideration of the Government during the past year, and it has been finally ordered, "that no estate shall be permanently settled in which the actual cultivation amounts to less than 80 per cent. of the culturable area; and that no permanent settlement shall be concluded for any estate to which Canal irrigation is likely to be extended within the next 20 years, and the existing assets of which should thereby be increased in the proportion of 20 per cent." Instructions have accordingly been issued by the Board of Revenue and in the Irrigation Department.

The gross collections in Customs amounted to 1,123,670*l.*, as compared with 1,045,950*l.*, or eleven twelfths of 1865-66, showing an increase of 77,720*l.*

There have been none of the rapid fluctuations of trade observable in former years, consequently a steady increase appeared to have occurred in the receipts during each month of the year.

A satisfactory increase has to be noted also in the gross receipts realisable from Stamps, mainly under the head of Judicial Stamps.

Since the organization of the Central Provinces, the public Revenue has received full attention. There is now a Forest department, yielding a revenue of 40,000*l.* a year. The Salt Tax, which in 1861 afforded an income of 90,000*l.* annually, now realizes 180,000*l.* This increase has been gained without raising the duty or burdening the poor; indeed at the present time the retail price of salt at Nagpore is cheaper than it has been for the last seven years. The Liquor Excise Revenue has been placed on a sound footing, and every attempt to encourage intemperance has been done away with. The Stamp Revenue has been more than doubled during the last five years; and the burden of certain local assessed taxes, which used to press upon the poorer classes, has been transferred to the richer, with benefit to the people and the public treasury.

The public Revenue has been punctually realized during the past year. The total receipts were about 6 per cent. in excess of the income of the preceding year.

The total demand for Land Tax amounted to 646,170*l.*, being 89,589*l.* over the demand of the foregoing year. Out of this, 641,125*l.* were collected, leaving a balance uncollected of 5,045*l.*; but of this, 2,449*l.* only were realizable. The net balance, therefore, amounted to one third per cent., on the total demand, as compared with one half at the end of 1865-66.

The regular settlement in these Provinces progresses satisfactorily. Five additional districts have been completed, and two more (Chindwara and Upper Godavery) are very near to completion. There remain only Chutteesgurh, Chanda, Nimar, and Mundla in which operations have to be forwarded. In districts where settlements have been completed, a copy of the record of rights, and of the field survey of his estate, is placed in the hands of every landholder. The people now fully understand their rights, and appreciate the value of the record thus made over to them.

The total yield of the Salt and Sugar taxes may be compared thus: in 1865-66, 183,330*l.*; and in 1866-67, 160,653*l.* The decrease was owing to the temporary stoppage of imports during two months at the close of the year, which materially affected the receipts for the whole year. This is explained by the fact that the new arrangement for collecting the duty at the railway stations had not been matured. The completion of the railway to Nagpore is expected to give a large impetus to the trade in Bombay salt, and enable it to compete with the Madras salt, which comes in through another part of the country. Prompt measures have been taken to repress the system of smuggling, of which there was every appearance in the year 1865-66.

The total Excise Revenue was 97,554*l.*, as compared with 92,799*l.* in 1865-66. The increase was thus five per cent. in excess of the receipts of the foregoing year.

The improvement of the Excise Revenue by the adaptation of the central distillery system, especially in the Nerbudda Division, contrasts most favourably with the monopoly farm system in other districts. It has been ascertained that the liquor consumers of the open country can afford to pay higher rates, and accordingly the rates of still-head duty have been raised in such parts, while

the licenses for retail sale in towns and populous tracts have been put up to auction, and fetched high prices. Thus the revenue has increased without any corresponding increase of drinking, the moral and material benefits of which have been noticed by both European officers and impartial Natives, and are becoming more and more apparent among the hill tribes.

The gross receipts from stamps realized 57,343*l.*, against 57,384*l.* in the foregoing year. The provisions of the Stamp law are being more generally understood, and offenders were systematically punished. Prosecutions for such offences against the revenue rose from 985 in 1865-66 to 1,199 in 1866-67.

The Pandhari tax, which is an ancient impost, has now been placed upon a firm legal basis; a corresponding increase took place in this source of revenue from 22,612*l.* to 33,297*l.* in 1866-67.

Punjab.

The season of 1866-67 was drier in the Punjab than its predecessor; the average rainfall for the whole province having been 22.9 inches against 26.5 inches in 1865-66. The deficiency was confined to the latter half of the year. The want of rain during the winter was very general, causing distress in some parts of the country.

	1865-66.	1866-67.
	£	£
Demand - - -	1,996,825	1,960,723
Collections - - -	1,941,975	1,944,575
Balances - - -	24,850	16,147

The demand and collections of revenue for the past two years are shown in the accompanying table. The balances outstanding were less than in the previous year, of which 1,184*l.* only was recoverable. The land revenue of the province generally, save in one or two instances,

has been realized with facility, and with less arrears than in 1865-66. There has been a reduction of over 5,000*l.* in the regular revenue; in addition to which there was a further reduction of 15,000*l.* from the revised settlements in the Amritsur division, owing mainly to the system adopted of assessing canal villages at un-irrigated rates, allowing the canal department to reap the whole benefit of the share due to the Government from increased assets resulting from such irrigation; a measure which has not met with the approval of the Government of India. A considerable addition, however, to the revenue was expected during the current year, on re-assessment of these estates.

A great accession to revenue took place from sale of wood for railway and other public purposes.

The districts of Mooltan and Dera Ismail Khan suffered from drought during the past year, which necessitated a certain amount of relief; and it was expected that the balances of revenue in Peshawur would have to be remitted in consequence of the inundations which occurred in that district.

Of the financial results of the new settlement operations that have been carried on of late years in the Punjab, it appears that the immediate result for the districts of Goordaspore, Amritsur, and Sealkote in the Amritsur division would be a net decrease of revenue to the extent of 4,540*l.*, but which decrease would disappear within 15 years, and be converted into an increase of 4,041*l.*, and after 15 years to an increase of 5,257*l.* over the amount of last settlement. In the districts of Lahore, Goojerat, and Goojeranwala, which were in course of settlement, there will be an immediate increase of revenue of 16,500*l.* on a present assessment of 16,200*l.*, which increase will be enhanced by 8,000*l.* within 15 years, and by 4,500*l.* more after 15 years. The net result of the assessment of the six districts assessed up to date will be, in round numbers, an immediate increase of revenue of 16,400*l.*, with an ultimate increase after 15 years of 35,000*l.*, upon an aggregate revenue of 497,300*l.* The net cost of these settlement operations was estimated at 55,000*l.*, so that the entire cost to Government was expected to be recovered in three years from the enhanced revenue obtained.

Of the other branches of revenue of this province there has been a corresponding increase under each item, the aggregate collection of which amounted to 1,085,185*l.* in 1865-66, and 1,144,173*l.* in 1866-67, thus showing an increase of 58,988*l.*

Hyderabad
assigned
districts.

The area of cultivated land in the assigned districts of Hyderabad was 4,592,228 acres, being 374,859 in excess of the quantity in the previous year, or equal to nine per cent. The land revenue demand rose from 397,144*l.* to 425,431*l.*, thus exhibiting an increase of 28,287*l.*, which had been collected without the slightest difficulty. The arrears only amounted to 1,188*l.*, of which about 156*l.* were said to be irrecoverable. Advances and remissions on account of revenue are unheard

of

of in these parts, and land is eagerly sought for. In 1866 the average prices of grain reached their highest points, and a sensible reduction was felt in the year following.

The revenue from excise duties amounted to 107,137*l.*, being 27,563*l.* in excess of the previous year; the outstanding balances at the close of the year amounted only to 540*l.* During the year the excise regulations were thoroughly revised, and the cultivation of opium was likewise regulated for the first time by a system of license. The total area under poppy cultivation was 3,902 acres, with a tendency to increase; the quality was pronounced to be excellent, and it commanded a high price in the market.

These districts will in future be included in the great salt cordon which stretches from the North of India to the Godavery, known as the Imperial Customs line. Heretofore this line was drawn at the banks of the Wurdah river. The revenue from the sales of manufactured salt showed a decrease of 2,497*l.*

The income derived from stamps was 26,187*l.*, against 23,767*l.* in the previous year, being an increase of 2,420*l.*

The gross revenues of this province rose from 509,019*l.* to 577,417*l.* in 1866-67, an increase equal to 13 per cent. The increase in revenue during the last six years was estimated at 80 per cent.

1865-66, Twelve Months.	1866-67, Eleven Months.
£ 1,001,453	£ 920,825

The total revenue for the Province of British Burmah would appear to have fallen greatly in the official year ended 31st March 1867, but when compared with eleven twelfths of the previous year there will be a small increase of 2,826*l.* This comparatively small increase was attributed to a reduction in the revenue from forests, amounting to 35,127*l.*, arising from the disturbances in Upper Burmah and the depressed state of the timber trade. In all other items of revenue there seems to have been an increase, particularly in Excise, Stamps, and Land.

	1865-66.	1866-67.
Revenue - - -	£ 6,331,713	£ 5,621,374
Charges - - -	666,856	620,353

The revenue in Madras amounted to 5,621,374*l.*, being 182,696*l.* less than eleven twelfths of the revenue of the preceding year. This decrease was due to the effect of a disastrous season, and to the almost complete cessation of collections on account of arrears of Income tax. The charges for

collection during the same period were 11 per cent. on the revenue, and exceeded those for the preceding year by 9,068*l.* This excess is accounted for by an increase to the service generally, principally in the Forest and Land Revenue establishments.

The drought which prevailed during the first half of the year 1866-67 created such a distress and suffering as had not been experienced since 1832, and, combined with the two preceding years having been unfavourable for agriculture, led to a famine in the Ganjam and Bellary districts, and happily the north-west monsoon, which commences in October, having brought a plentiful supply of rain, the prospects of the districts changed for the better. In the latter of the districts, a fifth of the number of cattle perished from want of water and pasture, and prices of grain rose correspondingly high; but in spite of these disadvantages the area under cultivation increased by 70,998 acres, though the assessment decreased by 8,472*l.*

There was a slight diminution in the receipts from the Timber customs, arising from the depressed state of the trade in the French territories. The revision of the Revenue establishments, which was concluded during the year under review, led to a net saving of 78,544*l.* per annum.

	1865-66.	1866-67.
Town and Island of Bombay	£ 7,724	£ 7,702
Southern Division - -	1,184,503	1,132,881
Northern Division - -	1,318,182	1,429,123
Sind - - -	356,853	292,135
Total - - -	2,867,262	2,861,841

The Land Revenue for the whole of the Bombay Presidency showed a decrease amounting to 5,421*l.*, which was slight, considering the period under review. The decrease in the Southern Division was assigned partly to a change in the dates fixed for the collection of the revenue instalments *in part*. In one district the decrease was occasioned by the commutation rates fixed for the Govern-

ment Grain revenue having been lower than in the preceding year.

The whole of the increase in the Northern Division is due to extended cultivation and enhancement of assessment leviable in those Talookas which have been brought under the Revenue Survey Settlement.

1865-66.	1866-67.
£ 592,014	£ 544,362

Of the other branches of revenue there has been a decrease under the head of Sayer Revenue, realizable for the whole Presidency, including Sind, amounting to 47,652*l*. This decrease was general throughout, and was partly due to the change of the official year and partly to the abolition of the Income tax, with the exception of one district in the Southern Division, where the increase was due to a large revenue having been derived from forests and other miscellaneous items. Throughout the Northern Division there was an increase under this head, amounting to 6,942*l*.

	1865-66.	1866-67.
	£	£
Customs - - - -	774,633	707,722
Salt - - - -	535,331	373,372
Opium - - - -	2,127,360	1,852,140
Miscellaneous - -	74,975	65,748
Total - - - -	3,512,299	2,998,982

The decrease in Customs duty amounted to 66,909*l*., of which 46,894*l*. was on Imports, and 20,015*l*. on Exports. The falling off in the latter is attributable to the general depression of trade. The decrease in Salt revenue was owing to fewer removals of salt, in consequence of a very large quantity having been taken away in the previous year, in anticipation of the increase in the

rate of duty, which came into force at the early part of 1865. The number of chests on which fees were levied were 30,869, against 36,200 in 1865-66, being less by 5,331. The revenue derived therefrom was proportionally less by 275,220*l*.

FORESTS.

Bengal.

The attention of the Forest Department in Bengal has been almost entirely confined to the forests of Sikhim during the past year. The difficulty in procuring labour has been overcome, and the wages of coolies have been less than in the previous year. A License system has been introduced to prevent the needless waste in the cutting of canes, which grow at an elevation of about 5,000 feet above the level of the sea. Licenses have also been granted for the collection of wax and lac.

During the months of March and April numerous fires annually occur in these forests, but by cutting away narrow strips of jungle along the sides of roads, the progress of this destructive element has been effectually checked. Boundary pillars have been erected in those districts where no natural limits for the reserved forests exist in the Terai.

The damage sustained by the forests in the Bhootan Division has been very great from the fact of the Bhootan Government leasing large tracts to zemindars, who sublet to timber merchants without any restriction. In order to obviate this evil these forests have been brought under the control of the Government of India.

North-west
Provinces.

The operations of this Department in the North-west Provinces have consisted principally in carrying out a new system of conservancy, as mentioned in last year's report (page 8). The actual Revenue for 1866-67 was 56,777*l*., and the Expenditure 31,475*l*., which, after deducting a deficit of 2,993*l*. for the Meerut and Gurwhal Districts, leaves a net Revenue of 25,302*l*.

In the Meerut Division it has been found necessary to extend the width of the boundary clearings from 10 to 40 feet, in consequence of the branches of trees on each side growing over and the jungle springing up. It is expected that in a very short time the heavy expenditure in this Division for making the necessary roads will cease, and conservancy will then be carried on at a moderate cost.

An Assistant Conservator of Forests has been appointed to the Goruckpore District, in the Benares Division. The value of timber obtained by thinning and clearing the forests of dead trees will more than cover the expenditure of the operations undertaken. These forests are expected to supply hereafter a large quantity of valuable timber for building purposes.

Central
Provinces.

The forests of the Central Provinces extend over an area of about 23,000 square miles, and are classed as reserved and unreserved forests. The demarcation of the former has now been brought almost to a conclusion. In the more important tracts these reserves are in full working order, and the people of the country thoroughly understand the rules for conservancy, making no attempt to trespass

trespass nor to injure the trees. Growing trees have been spared so as to keep in view the requirements of future years.

The most noteworthy explorations of the past year were made in the Chanda District; arrangements are being made to work these forests under special agreement, which will give to the proprietors a considerable revenue, and secure at the same time a regular supply of first-rate timber for the Nagpore and Godavery Valley markets.

The system of working the unreserved forests has now become consolidated, except in the Chutteesgurrh Division, where the demarcation of the boundaries between Government wastes and private estates has not yet been completed. The right of collecting forest produce is let out annually, the leases being taken up by the leading residents of the nearest tracts; thus a revenue to Government has been obtained with the least amount of inconvenience to the people of the country. A remarkable concurrence of testimony exists among all District officials, to the effect that the people have everywhere become accustomed to, and are satisfied with, the Forest Laws. Prosecutions for breach of these rules were exceedingly rare, and complaints of their stringency seldom heard.

The financial results of the past year, comprising only eleven months, have proved highly satisfactory as compared with the twelve months of previous years.

	Net Profit.
	£
1864-65 -	10,808
1865-66 -	13,716
1866-67 -	23,985

The plan of working the forests of British Burmah by Government contractors and permit-holders was still continued. The quantity of teak timber brought to the seaports from British territory showed a decrease of 14,279 logs when compared with the previous year, which is attributable to the distance the timber has to be dragged to the water, to the increased cost of removal, and to the short supply of water. The foreign timber brought down by the rivers Salween, Irrawaddy, and Sittang shows a proportionately larger decrease, as will be seen in the margin; the causes for which have already been given at page 37.

British Burmah.

	Logs.
1865 - -	126,382
1866 - -	69,538

The financial operations show a satisfactory result, leaving a net revenue of 14,136*l.*, to which should be added sundry receipts appertaining to the year's transaction of 14,156*l.*, making the result for the eleven months ending 31st March 1867 amount to 28,292*l.* as a gross net receipt.

	1866-67.
	£
Receipts - - -	42,649
Disbursements - - -	28,513

The general condition of the Forest Department in the Punjab, and the attention paid to conservancy, have improved. The timber results for a year, with no good floods, and officially only lasting 11 months, are stated to be satisfactory. As many as 22,600 holes were planted during the past year, towards the artificial reproduction of the deodar. Planting for fuel in the plains has been extended, and about 3,000 acres have now been operated upon, under the orders of the Conservator of Forests, with a fair measure of success. It is expected that by 1875 a sufficient area will so have been planted, as to ensure against a dearth of wood fuel, along the whole line of railway from Mooltan to the Jumna.

Punjab.

The system of Forest Conservancy in the Hyderabad assigned districts is similar to that in practice in the Central Provinces. The total revenue from this source has risen from 2,130*l.* to 5,172*l.* in 1866-67; and has been mainly obtained from a tax levied on wood brought for sale from unreserved forests, and from grazing leases. This tax, though appearing at first sight somewhat hard, is practically not felt by the inhabitants, who have always been accustomed to some impost on wood brought to market, the right to levy which had been frequently conceded by the Mahomedan Government to the marauding tribes on the hills, as a species of black mail. The amount realised from sale of Government timber was but small.

Hyderabad assigned districts.

Her Majesty's Government have acceded to the requisition for a trained forester from Scotland for these forests, on the recommendation of the Government of India, and a competent person has been sent out accordingly.

The receipts in the Forest Department for the Madras Presidency were larger than those of the previous year, the net revenue amounting to about 12,200*l.* A large quantity of timber was sold during the year, and the value of the

Madras.

stock at the depôts was less than at the end of 1865-66 by 1,112*l*. Specimens of the most valuable kind of timber were supplied to the Paris Exhibition.

The total net surplus of actual receipts over charges since the creation of this Department in 1856-57, including the value of timber in stock on 31st March 1867, shows an ultimate gain to Government, amounting to 185,804*l*.; thus a most valuable public property has been brought under conservancy, the vast timber resources of the country have been carefully developed, and the interests of the State and of the public have been protected from risks which were daily assuming greater magnitude, and which until lately scarcely attracted attention.

Bombay.

	1865-66.	1866-67.
	£	£
Receipts - - -	73,035	56,894
Expenditure - - -	63,392	50,070

In the Bombay Presidency the forest receipts fell short of that of the previous year by 16,141*l*., while there was an improvement in the expenditure, being less by 13,322*l*. The net balance to Government was 6,824*l*. against 9,643*l*. in 1865-66.

The deficiency in the Revenue was assigned to the generally depressed state of trade, which created but a small demand for timber during the year under review.

WASTE LANDS.

Bengal.

The number of grants for waste lands in the Bengal Presidency, under the old rules, made during the year 1866-7, was 23, with an area of 80,078 acres, the eventual maximum revenue of which will be 2,249*l*.; the total number of these grants up to the end of the year was 549, possessing an area of 1,315,778 acres, the eventual maximum income of which will be 39,051*l*. The present revenue received was 2,902*l*., realized from 724,743 acres granted in the Soonderbuns. The remaining grants, to make up the total of 1,315,778 acres, were effected in the tea districts of Assam, Cachar, and Sylhet.

The number of grants under the old rules redeemed was 16, with an area of 32,131 acres, for which the price of commutation already paid amounted to 4,098*l*., leaving a balance due of 4,486*l*. The aggregate number of grants redeemed up to the end of 1866-67 was 95, with an area of 242,676 acres, for which the price of commutation received was 25,482*l*., while a balance of 33,852*l*. remained to be paid.

Very few sales of waste land were effected, as compared with previous years; the total number of lots sold had been 620, with an area of 641,293 acres, and the price already paid amounted to 66,364*l*., leaving a balance of 267,104*l*. to be paid.

The cultivation leases taken up under the ordinary settlement rules were 761, up to the end of the year under review, covering an area of 103,370 acres, the present income of which was 7,035*l*., and the eventual maximum revenue will be 10,196*l*.

As the rates, and in some matters, the particulars of the leases, vary in different districts, the general principles upon which cultivation leases have been granted are as follow:

In Chittagong the rate is one anna or 1½*d*. per acre for the first five years, increasing a like sum for each similar term until the sixth quinquennial period of the whole term of lease of 30 years, when the rate will be 6 annas or ninepence per acre.

In the districts of Cachar and Sylhet the rate is rent free for the first three years; 4½*d*. per acre for the next five years; 9*d*. for the second, and 1*s*. 6*d*. for the third period of five years each; and 3*s*. per acre for the last twelve of the 30 years for which time the leases have been granted.

In Darjeeling the term of lease is for ten years only, of which two are rent free and for the remaining eight years the rate has been fixed at ninepence per acre.

In Assam, where there is a vast extent of waste lands, there are no fixed rates. The practice here is for any one to break up waste land at pleasure, paying only a fixed minimum rent for whatever land is cultivated. If the lands are retained the cultivator obtains at once a transferable title, subject to any tax that the Government may impose; but the lands may be relinquished without any responsibility, at the option of the cultivator.

With a view of affording relief to owners of tea plantations who had been suffering from the depreciation of their property, a somewhat exceptional rule has been laid down, by which the sale of a lot purchased prior to 1st January 1867, which has become liable to be sold for arrears of purchase money and interest, was held to be a sufficient satisfaction of the claims of Government against the defaulting purchaser on account of such lot; and a purchaser of more than one lot was permitted, on application before 1st July 1867, to relinquish any entire lot, and to transfer all sums paid on behalf thereof to the credit of other lots in his occupation, the payments for which had not been then completed.

In the Central Provinces the area of Government waste lands extends over 24,000 square miles. During the past year 46,262 acres had been sold in fee simple under the waste lands sale rules; the price realized was 12,889*l.*, or an average of 4*s.* 2*d.* an acre. Central Provinces.

But little waste land appears to have been sold in British Burmah, extending to 4,586 acres in the Tenasserim division only. But grants, under the rules of March 1865, had been made in the Pegu division to the extent of 55,413 acres under certain stipulations, during the past year. Further grants have been suspended until the Government of this province has been able to observe the use made of the privileges allowed under these rules. British Burmah.

The sales of waste lands in the Madras Presidency have been also of a limited character, amounting to about 2,274 acres. Madras.

FINANCE.

The income for the 11 months of the official year ended on 31st March 1867 amounted to 42,012,566*l.* against 48,935,220*l.* in 1865-66; and the expenditure was 44,639,924*l.* as compared with 46,169,152*l.* in the previous year. The surplus in 1865-66 of 2,766,068*l.* was therefore followed by a deficit of nearly equal amount in the year under review. Of the total expenditure in 1866-67, the sum disbursed in India was 37,094,406*l.*, and 6,814,469*l.* in England, to which must be added 731,049*l.* paid partly in India and partly in England, on account of guaranteed interest of Railway and other companies, after deducting the net traffic receipts. The expenditure had increased under the heads of army, public works, telegraphs, and marine. Receipts and Disbursements.

An increase has been made to the debt of India in this country, amounting to 2,592,600*l.* during the past year. This was effected by an addition to the bond debt of 1,932,700*l.*, a further issue of 130,000*l.* debentures, and an increase of 529,900*l.* to the capital of the five per cent. stock. The four per cent. debenture bonds, which became due during the year, were renewed at five per cent. Debt.

The amount of the public debt in India has also increased from 71,437,251*l.* to 72,526,815*l.* at the close of 1866-67; and the amount of cash balances in the treasuries of India was 11,057,054*l.* against 13,771,625*l.* at the close of the previous year.

The circulation of Government currency notes throughout India at the commencement of the year was 7,020,254*l.*, and at its close it amounted to 8,090,868*l.*, thus showing an increase in circulation during the year of 1,070,614*l.* The maximum circulation was 10,160,959*l.*, which was covered by 5,762,514*l.* in coin; 755,504*l.* in bullion; and 3,642,941*l.* in Government securities. The minimum circulation was 7,871,897*l.*, and the average was 8,989,317*l.* as compared with an average of 7,784,060*l.* in 1865-66, being an increase of 1,205,257*l.* The extensive use by the public, of notes of the branch circles in India, for the purposes of remittance to the Presidency towns, formed a marked feature in the transactions of the past year. These notes were cashed at the head office, and have been issued to persons requiring them in any amounts desired. Orders were issued by Government to facilitate the conversion of currency notes at Government treasuries. In the Bombay circle the amount of notes in circulation during the past year was liable to violent fluctuations, arising from the unsettled state of monetary affairs, and from the depression of trade generally. Paper Currency.

The business of exchanging notes was transferred from the Presidency banks to the Government on the 1st March 1867. The saving to the State by this change was expected to be considerable.

No returns of the operations of the Calcutta Mint for 1866-67 have as yet been received. Mint.

	1865-66.	1866-67.
	£	£
Value of--		
Silver coined	544,994	148,079
Copper coined	95,644	19,500
Total -	640,638	167,579

than to transmit bullion; hence the limited character of the Mint operations. For the first time in the history of this Mint, rupees were exported as bullion to England during the year.

	1865-66.	1866-67.
	£	£
Value of--		
Mint Certificates issued - -	7,530,434	1,835,940
New coins paid into General Treasury	7,020,900	2,563,440

close of the year 1865-66.

The License tax, which was introduced at the close of 1866-67, and which is referred to under the head of "Legislation" in the earlier pages of this Report, has been modified, and assumes now more the form of a tax on income.

PUBLIC WORKS.

Bengal.

The hindrance occasioned to the prosecution of public works in Bengal in 1865-66 by the paucity of officers available for such employment during the Bootan campaign was mentioned in the Report (page 16) for that year; and in 1866-67 the work was paralyzed by a similar scarcity of officers in many places, owing to the great demand on the establishment occasioned by the relief works in Orissa, and that not merely by the number sent to that province, but also by the fact that those selected were picked men for the work. The Superintending Engineer of the Cuttack Circle was left free to give his undivided attention to the relief and embankment operations in Orissa, and the duties of Consulting Engineer to Government in respect of the East India Irrigation Company were reserved for a separate officer.

The water supply of Fort William has been brought into active operation. About 4,000 persons are daily furnished with a supply of 16 gallons per head, which, including all such uses as watering roads, flushing drains, &c., is a much smaller quantity than was anticipated. The cost of the water is about one fifth of that which would be paid for the same quantity supplied by water-carriers. It is now no longer necessary to employ for any purpose the brackish water of the river.

The enlargement of the Cartridge and Percussion Cap Factory at Dum-dum has been completed, and good progress has been made in remodelling the Gunpowder Factory at Ishapore.

The Sailors' Home for unemployed seamen has been completed, and as soon as the arrangements for the out-offices are finished possession will be taken of the building.

	1865-66.	1866-67.
	£	£
Imperial outlay -	761,501	779,695
From local funds -	163,585	96,247
By civil officers -	118,455	88,800
Total - £	1,043,541	964,742

The plans and estimates for the central jails in Bengal are still under consideration, but it is feared that the climate will not admit of their being constructed of such cheap materials as those in the North-west Provinces. The Central Penitentiary for European convicts at Hazareebaugh is nearly complete.

The expenditure on account of public works in Bengal was less by 78,799*l.* than in the previous year.

The aggregate expenditure on public works in the North-west Provinces exceeded that of the previous year by 69,697*l.*, this increase having been in the outlay from the Imperial Treasury. In addition to the expenditure from local funds, a sum of 7,108*l.* was defrayed by private individuals on works of public utility. These consisted chiefly

North-west Provinces.

	1865-66.	1866-67.
	£	£
Imperial outlay -	578,900	704,496
Local outlay -	204,208	148,309
Total - £	783,108	852,805

of

of wells alongside some road. As many as 195 such wells were constructed during the past year.

The principal military works in hand during the past year were the completion of new barracks at Agra and Morar for artillery, also some new barracks in the fortress of Gwalior. Final orders as to the size of the infantry lines for the new cantonment at Nowgong having been received, the construction of the buildings has been taken in hand.

Of civil works, new central jails were in course of construction at Benares, Allahabad, Futtehghurh, Bareilly, and Agra. The public offices at Allahabad have been delayed in consequence of certain ironwork required from England. No progress worth noting has been effected in the completion of the memorial church at Cawnpore, in consequence of the want of a qualified assistant as superintendent of the work, the executive engineer's time having been fully occupied in another channel.

A landslip occurred at the Mohund Pass on the road from Roorkee to Dehra, which overthrew one of the wings of a tunnel. At first it was determined not to restore it; but the treacherous nature of the soil prevented the execution of the work in open cutting, and tunnelling was found to be necessary. This work was successfully completed without any accident. The whole of the road between Agra and Bombay is now open, and the only works remaining are those necessary to prevent interruption to traffic in wet weather. Satisfactory progress has also been made in the Bundelcund roads during the past year.

	1865-66.	1866-67.
	£	£
Imperial outlay -	395,901	327,642
Local outlay -	25,250	115,000
Total - £	421,151	442,642

The expenditure on public works in the Central Provinces was greater than in the preceding year by 21,491 $\frac{1}{2}$ %, the increase being due to the large amount expended by the several local and municipal committees.

The heaviest expenditure for military buildings appears to have occurred at Jubbulpore, Saugor, Kamptee, and Nagpore, and good progress is reported on the works in hand. The Government of India having sanctioned the improvement of the defences of the fort at Seetabuldee, with permanent accommodation for the European garrison, the works have been commenced.

In civil works very satisfactory progress has been made in the advancement of the four central jails at Nagpore, Jubbulpore, Hoshungabad, and Raipore, in the construction of which convict labour appears to have been utilized to the utmost, with good financial results. The construction of permanent police buildings has been in abeyance, waiting a revision of standard plans. A handsome post office near the railway station at Nagpore was expected to have been completed in August 1867, and a new telegraph office at Jubbulpore is well advanced.

Among the miscellaneous and municipal improvements which have been commenced or completed during 1866-67 may be enumerated schemes for supply of water to the towns of Nagpore and Hinghunghat, a town hall at Jubbulpore, a clock tower at Hurdah, market places at Toomsur, Seonee, and Baitool. In addition to these, the example that has been set by public bodies towards improving street architecture, opening broad streets and squares in chief towns, has stimulated private individuals toward similar exertions, and it is reported there is hardly a town of any importance but has its drinking fountain, well, schoolhouse, dispensary, or some public building erected by private munificence.

Great efforts have been made towards completing the Godavery navigation works up to the first barrier, which, when finished, as it was expected to be by June of this year (1868), will throw open the river for use to a distance of 220 miles from the sea.

	1865-66.	1866-67.
	£	£
From Imperial Revenues -	583,818	702,226
Local Funds - - -	180,560	169,549
Total - - -	764,378	871,775

The expenditure in the Punjab had increased by 107,397 $\frac{1}{2}$ %. Of the whole sum assigned for this purpose a large proportion, or about one half, was expended on works connected with military buildings, roads, and bridges; and as much as 50,000% had been disbursed on account of miscellaneous

public improvements out of local funds.

A sum of 77,950% had been expended on Public Works in the Hyderabad assigned districts, against 65,928% in 1865-66; the bulk of which was for civil buildings

buildings and local works, amounting together to 45,051*l.*, and as much as 22,534*l.* was spent in the construction of necessary roads required for these districts, in which satisfactory progress has been made, considering the difficulties existing in the black yielding soil of Berar. Of the Civil buildings completed may be mentioned two court houses, with offices attached; a jail capable of containing 500 prisoners, and several police stations, &c. The municipal expenditure of the past year amounted to 32,755*l.*, but the work was generally of a petty nature. The only city of any size or consequence is Oomrawuttee, where several large schemes have been taken up. Conservancy establishments have been maintained in all towns of any size or importance; and in most parts of Berar the number of local schemes pressing for early execution was very great.

Burmah.

During 1865, partly from want of labour, and partly from causes over which there was no control, public works in British Burmah had been much impeded, but in the following year satisfactory progress had been made under all heads except military.

	1865-66.	1866-67.
	£	£
Imperial outlay - - -	182,081	183,066
Local outlay - - -	30,788	67,000
Total - - -	212,869	250,066
Imperial outlay for Port Blair - - -	45,006	28,984

The expenditure in British Burmah during the last two years contrasted favourably, particularly in comparing the outlay on local works with that in the previous year, which may be considered sufficient evidence of the energy displayed in pushing on improvements during the year under review.

Among the miscellaneous public improvements which have taken place in these provinces, at the expense, principally, of the municipalities, it may be stated that

at Rangoon, besides the construction of roads, streets, and drains, planting and watering of trees, &c., the whole expenditure for the eleven months ended 31st March 1867, for municipal improvements, amounted to 33,000*l.*, nearly at the rate of 3,000*l.* a month, which was considered a very large sum for so young a town to afford. The main pier at Akyab has been completed, and has already been used by ships.

Madras.

Expenditure.	1865-66.	1866-67.
	£	£
Imperial outlay - - -	639,684	620,400
From local sources - - -	54,133	84,209
Total - - -	693,817	704,609

In the Presidency of Madras as much as 704,609*l.* had been expended on works of public utility, exceeding the outlay during twelve months of the previous year by 10,792*l.* The imperial outlay, as shown in the margin, does not include advances to civil officers.

Rates of labour increased in almost all the districts, in consequence of the high prices of the common necessities of life.

The new Central Jail at Rajahmundry has been completed, also one at Coimbatore.

RAILWAYS.

Several events occurred during 1866-67, both in England and in India, to disturb the progress of railways. In this country financial disasters tended much to check the raising of capital, and in India commercial difficulties interfered with the development of traffic. At the same time, however, the construction of lines of railway was not allowed to be impeded by the deficiency of funds of some of the companies, the Government having readily come forward with the necessary advances.

At the commencement of the year 1866 there were 3,331 miles of railway completed, since then 306 additional lines had been finished, making a total of 3,637 miles open for traffic on 1st May 1867; and leaving 2,005 miles to complete the net work of railways sanctioned for India. An addition of 7,750,000*l.* had been made to the capital expenditure, which on the 1st April 1867 reached a total of nearly 68,000,000*l.* The materials sent out during the year under review amounted to 326,845 tons, of the value of 2,658,357*l.* The aggregate quantity of goods sent, for the use of railways in India, from this country, had reached 3,195,862 tons on 1st January 1867, costing about 20,200,000*l.* in round numbers.

The following table exhibits very favourably the traffic operations of all the railways in India for the past two years.

The

Years ended 30th June	Gross Receipts.	Working Expenses.	Net Receipts.	Number of Passengers.	Receipts from	
					Passengers.	Goods, &c.
	£	£	£		£	£
1866 -	4,537,235	2,225,495	2,311,740	12,867,000	1,278,580	3,091,723
1867 -	4,898,727	2,563,309	2,335,418	13,738,472	1,446,426	3,314,903

The Indian Branch Railway has now become a guaranteed Company, and its designation has been changed to that of the "Oude and Rohilcund Railway Company, Limited." A portion of their line, from Lucknow to Cawnpore, was opened for traffic in May of last year.

The line of railway between Allahabad and Jubbulpore, a distance of nearly 90 miles, was also opened for traffic on the 1st August 1867, but in consequence of the failure of some of the works, the opening of the Great Indian Peninsula Railway, which joins the East Indian line at the latter place, and which was expected to have been finished by the close of 1868, has been delayed.

A serious accident occurred on the Great Indian Peninsula Railway by the fall of the Mhow-kee-Mullee viaduct on the 19th July last, which might have terminated more disastrously, but fortunately no loss of life or injury to any person was experienced. Every means were taken restore the communication without loss of time. This viaduct formed part of the Bhore Ghat incline, the traffic on which had been conducted since 1863, and originally cost something under 45,000%. The new viaduct, which is to replace it, is estimated to cost about 36,000%.

Her Majesty's Government have sanctioned the construction of a new passenger station or terminus at the Presidency town in consequence of the increasing growth of the traffic on the Madras railway. An eligible site near the people's park, and not far from the company's present goods station, has been selected, and the ground has been cleared for the purpose. The removal of this terminus to a more central locality will enable the traffic operations, both in goods and passengers, being conducted with greater economy and convenience.

The Government Director of the Indian Railway Companies (Mr. Juland Danvers) in his report for 1866-67 writes that "in spite of commercial depression and monetary disasters, of drought and famine, of unprecedented floods and destructive inundations, the works under construction have steadily progressed and the traffic has increased. A larger expenditure has taken place than in several proceeding years, the revenue has been greater than at any previous time, and the effects of the railways upon the general prosperity of the country have been abundantly manifested, whether regarded in relation to its material progress, to the comfort and convenience of the people, or to their social improvement."

TELEGRAPHS.

The total number of miles of Government Telegraph throughout India open on 31st March 1867 was 13,371, of which 11,826 miles were single lines. The amount of capital, including the outlay, during the year, was 1,081,676l. The total receipts for the year amounted to 142,978l., and the expenditure for maintenance and repair, &c. was 136,275l., thus leaving a profit of 6,703l. The number of messages transmitted was 29,444 on account of Government, 239,422 private, and 10,200 free messages, making an aggregate of 279,066 messages. The value of messages transmitted was 103,490l., against 102,021l. in 1865-66, being an increase of 1,471l. This increase appears to have been smaller than was expected, and is attributable partly to the peculiar stagnation of trade during the year. The average cost of a message was 7s. 8d.

The number of Indo-European messages amounted to 24,455, giving a monthly average of 2,223, against a total number of 27,517 and a monthly average of 2,293 in the preceding year.

A new system of accounts, similar to that in use in the Public Works Department, has been established, by which a more speedy audit and adjustment of

subordinate officers accounts has been attained, besides enabling a better check being kept on expenditure by the head office.

In June 1866 an attempt was made by a wealthy banker in Ajmeer to bribe the telegraph officer in charge, to divulge the information contained in the opium messages received at that station. It was duly reported, and the offenders were subsequently convicted, and punished by a fine of 400*l.*, with six months imprisonment. The Government employes were rewarded for their conduct on the occasion.

The new cable between India and Ceylon was successfully laid in January 1867 in two sections, the one, being 29 miles in length, was laid across Palk's Straits from Talamanaar Point in Ceylon to the temple of Rameseram on the Indian side, from this last point a land line is carried across the island of Rameseram to the Paumbem telegraph office, a distance of about 10 miles, whence two separate cables, each a mile and a half in length, cross the channel completing the communication with the main land. The tests that were applied after the cable was laid gave very satisfactory results.

During 1866-67 a second wire was completed between Deesa and Hyderabad in Sind, a distance of 319 miles, in the short space of three months. This line forms part of the two main lines to Bombay and Calcutta, and will ultimately no doubt require four lines as the traffic on them increases.

Besides the foregoing, the line from Deesa to Ahmedabad, 98 miles in length, was also fitted with two wires, as was also the section from Bombay to Surat, of 168 miles.

The line between Kurrachee and Hyderabad had also been doubled during the year under review. It is expected that this section will be obliged to have six wires, in consequence of the whole of the Indo-European traffic passing along it. In the completion of the double line between Kurrachee and Bombay, that portion between Ahmedabad and Surat by Broach was expected to be finished in May 1867.

At Deesa, where the Indo-European messages for Calcutta will branch off *viâ* Agra, a distance of 473 miles, so as to complete the communication, a second wire has been erected. The old line of telegraph from Allahabad to Agra, 324 miles in length, formerly conducted along the grand trunk road *viâ* Cawnpore to Futtehghurh, thence by Mynpoory to Agra, has been removed, and a new line has been constructed alongside the railway, by which a saving of 44 miles has been effected; and a new line containing four wires has also been completed between Allahabad and Mogul Seraie, a distance of 102 miles.

In Bombay town the signal office has been removed from Colaba to the Fort, a change which has been highly appreciated, as one of great public convenience.

The only important work in Madras Division was the completion of the Hyderabad and Bezwarrah line, which had to be thoroughly reconstructed.

In the Central Provinces an entirely new line of telegraph has been constructed along the road between Nagpore and Chanda, a distance of 103 miles, with a branch to Hinghunghat, which is the principal cotton mart in these parts. At this last place a telegraph office was opened early in 1866, affording great convenience to the cotton trade, whence a telegram was despatched to Liverpool, reaching its destination in 38 hours.

Telegraphic communication was much interrupted during the past year in British Burmah, arising from injuries caused by jungle fires, storms, or wild beasts. A new cable has been laid between Moulmein and Martaban.

IRRIGATION AND CANALS.

Bengal.

A large quantity of work has been done to the embankments in Orissa, partly in consequence of the necessity for affording relief to the distressed population, and partly on account of the great damage done by the unusual floods.

With the view of properly regulating and controlling the large streams of that province, and of deciding what works should be entrusted to the East India Irrigation Company, a committee, consisting of the Commissioner of the division, the Chief Engineer of the Company, and the Superintending Engineer of the Cuttack Circle, was appointed to report on the subject; and survey parties were authorized for the collection of the necessary data.

The

The better regulation of the floods of the Damoodah, Roopnarain, Selye, and Cossye rivers has also engaged the attention of the Government; and Lieutenant Heywood was employed in the cold season to explore the upper reaches of the Damoodah and its tributaries.

The works of the East India Irrigation and Canal Company have made considerable progress, with the assistance of the funds advanced for this purpose from the Government treasuries. The principal works in course of construction are: the Naraje weir which is to regulate the quantity of water to flow into the Mahanuddy and Katjooree rivers respectively; the Kendraparah and Taldunda canals and Machgaon branch which were in progress; the High Level canal, into which the water has been let for a length of 11 miles; the Midnapore canal, which is open for 20 miles, between Oolobariah on the Hooghly and Panchkoora on the Cossye; and the Tidal canal which admits of inland navigation from Calcutta to Baligai, within 25 miles of Jellasure.

A special officer has been appointed as Consulting Engineer to the Government of Bengal in respect to the Company; and, at the solicitation of the Company, a Deputy Collector, paid by them, has been selected to explain to the people the advantages which will arise to them from the use of artificial irrigation.

The Gauges canal consists of 653 miles of main canal and 2,968 miles of distributing channels. The gross income shows an increase of $11\frac{3}{4}$ per cent. over that of the previous year, of the total income $92\frac{1}{4}$ per cent. was derived from water rate, and $7\frac{3}{4}$ per cent. from miscellaneous sources. The total area irrigated was 633,774 acres. The water rate per acre averaged about 4s. 6d. per annum. The Orissa famine created a considerable traffic in grain, of which, it was estimated, about 8,000 tons must have passed down the canal during the last nine months of the year 1866-67.

North-west
Provinces.

The operations which have been carried on towards improving the outfall of the Solani river, and so obviating the mischief effected to the Ganges Khader drainage works, have been most successful; its floods have been controlled, and were employed in silting up swamps, instead of devastating the Khader lands; and drainage cuts have been formed for the relief of marshy lands in the upper portion of the valley.

The Eastern Jumna canal is 130 miles in length, with 596 miles of distributing channels. The gross income for the year exceeded that of 1865-66 by 25 per cent., partly due to the fact of cultivators having become more reconciled to the enhanced water rates, which at one time gave a check to irrigation. The water rates remain the same, and the areas irrigated were 82,137 in 1865-66 and 157,398 acres in 1866-67.

The Doon canals comprise five small canals in the Dehra Doon, aggregating 57 miles in length, with 10 miles of minor channels. The increase in the gross income was $20\frac{1}{2}$ per cent. over the previous year, arising from the fact already named. The areas irrigated were 3,577 acres in 1865-66, and 7,047 acres in 1866-67.

The total number of miles comprising the Rohilcund canals is 153. This does not include the Kylas canal, which is not yet finished. The gross revenue showed an increase upon that of 1865-66 of 51 per cent., and was nearly equal to the revenue obtained in 1864-65, the largest yet realized. In addition to those above named, there are two other canals, but one of them was closed while the head works were being repaired.

The Agra irrigation works, which consist of the Futtehpoore Seekree reservoir and the channels leading therefrom, appear to have been unused for sanitary and other reasons during the past year. The escapes were left open, and no water was stored.

The Humeerpore irrigation works comprise one lake at Jeitpore and seven lakes at Mahoba; the first aggregate seven miles in length, while the latter have 25 miles of watercourses. The gross revenue showed an increase of $21\frac{1}{2}$ per cent. over the preceding year.

In the Central Provinces the progress that was hoped for in irrigation works had not been realized. Of the schemes selected, estimates for the Saonair alone were submitted; but the project was practically valueless from its great cost. The management of the irrigation division has passed into other hands, whence better results were looked for.

Central
Provinces.

In the Madras Presidency the operations of the main canal from Soonkasala to Cuddapah, a length of 188 miles, had come to a standstill. The Madras

Madras.

Irrigation and Canal Company, having expended more than nine tenths of the guaranteed capital, were obliged to suspend works until their appeal for assistance to the Secretary of State for India met with a favourable result. It was arranged, under certain conditions, that a sum of 600,000*l.* should be advanced to the Company, and accordingly, upon the contract being signed on the 6th October 1866, the Company at once resumed operations, though only to a trifling extent, at the close of the year.

AGRICULTURE.

Exhibitions,
fairs, &c.

In consequence of the distress which was felt throughout the Bengal Presidency, no exhibitions were held during the past year except one at Tezpoore in Assam, on the 27th December 1866. Though the exhibition was reported to be successful, yet the result was not such as to justify its repetition in this part of India, except it might be in connexion with a local fair, when perhaps the people might be induced to attend in greater numbers, and more readily exhibit their products. The expenses of this exhibition amounted to 239*l.*, and the assets realized only 123*l.*

Towards the close of the year an exhibition of the agricultural and industrial products of the North West Provinces was held at Agra, and the opening ceremony took place on the 4th February 1867. The success that was attained was far greater than was anticipated; the contributions of exhibitors exceeded the almost extravagant space which had been provided. The admission was free to all, excepting on the days of opening and closing; and the presence of large crowds of women and children of the agricultural classes was a satisfactory indication both of the freedom of access, and of the readiness with which the people availed themselves of it. Every endeavour had been made to popularize the exhibition; to enable the people to understand that the aim of the Government was simply to promote their general good; and the effect produced upon the Native mind was something considerable. The total cost of this exhibition was somewhat less than 25,000*l.*, of which 2,500*l.* had been received from the Imperial and 2,500*l.* from the Local Government; the remainder had been contributed from local and municipal resources.

Agricultural exhibitions had also been held during the year at Bareilly, Seharunpore, Dehra Doon, and Oraie; the first of these was particularly interesting, from the intelligent share taken in the proceedings by most of the leading gentry of the province. The steam engines and machinery imported for drainage and irrigation works attracted great attention, and were exhibited in full work.

The Etawah Fair, although of a totally different character to the exhibitions previously noticed, is a mere Native fair, possessing peculiarities of itself, and not altogether devoid of interest. Unlike other great fairs held in these provinces, it is neither hallowed by antiquity nor sanctified to the people by any superstitious feelings. It has no shrines, nor is it a place of pilgrimage, and originated spontaneously in the desire of the inhabitants to celebrate the opening of a new square in the centre of the city constructed principally from their own contributions, being surrounded by the High School, Public Offices, the Civil Court, the Hospital, various markets and shops, the whole promising to form, when complete, a *tout ensemble*, which, for its cleanliness, neatness, and convenience, will be unequalled in these provinces. During the past year the fair was specially successful; it lasted 15 days, during which time nearly 70,000*l.* worth of European and Native manufactured goods were disposed of by retail, and it is supposed that there were no less than 200,000 visitors. No accident, contretemps, or crime is said to have occurred, affording most striking proof of how much may be effected under judicious direction, through the agency of the people themselves; for the whole of the arrangements were entrusted to the Native municipality.

The fair that is annually held at Hurdwar, taking its name from this town, and situated on the banks of the Ganges, near Roorkee, is a well-known Hindoo place of pilgrimage, where a large concourse of people assemble for the purpose of bathing in the sacred stream, and for other religious ceremonies. Every twelfth year it assumes large proportions, and during the past year it was computed that their numbers, on the great bathing day, did not fall far short of 2,885,000. Every possible measure was taken by the officers of the Government to ensure comfort to the people, and to avoid anything like confusion, special
attention

attention having been paid also to the conservancy and sanitation of the various camping grounds. The principle of the Dry Earth Conservancy (alluded to under the head of Sanitary in this Report) was generally adopted. A large body of police was drawn from neighbouring districts, for the preservation of order and prevention of crime, and the heavy and responsible duties which devolved upon them were discharged with the greatest efficiency and success. The people resorted to them with confidence in their difficulties, gratefully acknowledging the attention received from them.

The marked success which attended the Nagpore exhibition, held in December 1865, led to the holding of a similar display at Jubbulpore in 1866, to which allusion was made in last year's Report (page 29), the result of which last was equally favourable as on the former occasion. In some branches of manufacture there was a decided improvement in the Jubbulpore as compared with the Nagpore exhibition, particularly in those departments of industry which received European supervision. Among cattle breeders and growers of produce, much encouragement and instruction was also derived. These displays have been instrumental in bringing landowners to purchase and use hydraulic and agricultural machinery, some of which are actually at work in towns and villages of the different districts. As evidence of the interest taken in machinery generally, nearly 5,000*l.* worth of articles shown in this department were purchased.

The visitors to the Nagpore exhibition consisted chiefly of people from districts round Nagpore, and from the whole country below the Sautpoora Hills, with a few of the wealthier inhabitants of the Saugor and Nerbudda territories, but none of the middle class of these parts, such as landowners and traders, were present. These people, who as a class are well to do and intelligent, came in crowds to the Jubbulpore exhibition. Koonbees and Lodhees from the Nerbudda Valley; Rajpoots from the borders of Bundelcund and Baghelcund; Gonds and other aboriginal tribes from the wilds of Mundla and Seonee, were also present on the latter occasion.

The satisfactory result attending the annual exhibitions of cattle and agriculture at Addanky and Nellore in the Madras Presidency has led to a similar display at Calicut and Machery, they were well attended, and promised well for the future.

An attempt was made to exhibit agricultural machinery, produce, and stock in February 1867 at the annual Mhyjee Fair, in the Khandeish Collectorate of the Bombay Presidency, which was attended with moderate success. Owing to the lateness of the season at which the sanction of Government was obtained, it was not found practicable to obtain machinery from England, but several implements were however exhibited by a firm at Bombay. Those which attracted greatest attention from the assembled agriculturists were the several descriptions of machinery for lifting water for irrigation purposes, and the winnowing machine, also the chaff cutter and the grain bruiser. Two of these winnowing machines had been purchased by the Collector, and sent into the wheat districts of the Taptee Valley, where it was expected they would soon pay their expenses on being worked for their hire.

A great improvement was also visible in the show of horses. The produce of the Government stallions excelled those of past years. Every effort was made to divest the Native mind of the idea that Government would claim the foals from mares served by their stallions. Time alone will secure confidence in the measures taken by Government for improving the breed of horses.

The prizes for cattle were warmly competed for; about 1000 head were exhibited, and among them some very fine animals.

Among the articles of produce exhibited were some fine specimens of sugar-cane, wheat, indigo, and the common grains of the country, but the most important of all was cotton.

In connection with this subject, the establishment of a model farm has been suggested, with a view of introducing and acclimatizing foreign products, improving breeds of horses, cattle, &c., and practically teaching the ryots the use of machinery and improved modes of agriculture; but the information being considered insufficient, the Government has not sanctioned the proposition.

During the past year, a commission was appointed to inquire into the present condition of the tea districts in Bengal. The commission was to consist of three members selected by Government, and to be entirely unconnected with the planting interest, so as to be perfectly free from any bias upon the subject, with

Tea.

an additional member representing the interests of the planter, appointed by the British Indian Association. The object of this commission was to collect every information bearing on the prosperity or otherwise of the tea plantations, and on the treatment and condition of the labourers employed on the estates. The necessity for taking this course arose from a previous inquiry which had been instituted respecting the mortality which had of late years occurred among emigrants despatched to the tea plantation, in reply to the request for labourers; and from the planters having complained of the want of proper care and attention to their health and comfort on the sea passage thither, and that the regulations laid down by Government had failed in reducing the death-rate.

The employment of Native labourers in Assam, Cachar, and Sylhet having been much commented on, various proposals were made, with the view of making the contract lighter to the labourers, and of relieving the employer of labour from some of the burthens laid upon him by existing laws. Fresh legislation is, however, deferred until the report of the commission has been received.

Assam.	1865.	1866.
	Acres.	Acres.
Area under tea cultivation	45,827	43,500
	lbs.	lbs.
Out-turn of tea - -	2,571,680	2,938,563

was under actual cultivation in 1866. An increase, however, of 366,883 lbs. was visible in the out-turn as compared with the previous year.

Cachar.	1865-66.	1866-67.
	Acres.	Acres.
Area under cultivation -	20,005	20,906
	lbs.	lbs.
Out-turn of tea - -	927,825	1,722,068

Sylhet.	Acres.	Acres.
Area under cultivation -	3,145	2,210
	lbs.	lbs.
Out-turn of tea - -	172,130	169,600

Darjeeling.	Acres.	Acres.
Area under cultivation -	9,829	7,986
	lbs.	lbs.
Out-turn of tea - -	335,481	371,174

The figures in accompanying table can only be approximately rendered, as there appears to be a great difficulty in getting any authentic information in a collective shape, from the unwillingness always exhibited by the planters in supplying it. Out of 477,576 acres of land held for tea planting, only 43,500

The total area of land applied for and granted in Cachar was 453,997 acres, of which 20,906 acres apparently have been actually cultivated, and the out-turn of tea has increased by 794,243 lbs. There are many gardens in this district whence no returns have been received.

The information in respect to this cultivation in Sylhet was also incomplete. A comparison of results is shown, however, annexed, from such returns as were available.

In Darjeeling the number of factories had decreased by 8, and the acres under cultivation by 1843. This decrease was explained by the fact of there having been little or no extension during the year under review, and to cultivated lands of the poorer sort having been purposely allowed to relapse into jungle.

The actual out-turn, however, appeared to have been favourable.

Tea is also cultivated in Dacca, Chittagong, and Chota Nagpore. The quantity exported from Calcutta amounted to 6,936,843 lbs. against 4,581,830 lbs. in eleven-twelfths of 1865-66, being an increase to the extent of 2,355,013 lbs. Although tea planting had been successful in the north of Arracan, yet the difficulty of obtaining labour discouraged capitalists in coming forward.

The Deputy Commissioner of Kangra, in his annual report on the cultivation of tea in that part of the Punjab, remarks that great improvements are apparent on the estates held by European planters. Year by year the cultivation is extended; and by a system of high culture, already introduced in many of these estates, the quality of the tea is getting better and better, and will gradually reach a point of excellence as to make it more popular in the market. Tea planting in the Murree hills has, after a series of trials, proved a failure, and the Government experimental plantations have been finally abandoned.

Opium.

Opium.	1865-66.	1866-67.
	Acres.	Acres.
Extent of land taken -	275,784	289,062

chests of provision opium, and 3,523 chests of abkarree opium. And in Behar and Benares the area had increased from 700,000 to 750,000 acres.

The

The total number of Chinchona plants existing in Government plantations of the Bengal Presidency amounted to 782,048, and in those of private companies to 232,778. There were 1,194 plants of *C. Succirubra* distributed to planters in Darjeeling during the year 1866-67; 600 were despatched to Chittagong in furtherance of the experimental cultivation carried on in that district; 300 plants were also sent to the Saharunpore Botanical Gardens; and 650 to the Cossyah Hills, where a nursery had been formed for the introduction of Chinchona by private individuals in Assam. In the Madras Presidency the average number of plants propagated recently increased to 48,968; there are now 557,551 trees planted, the oldest of them being as much as from 15 to 22 feet in height; they have blossomed freely, producing excellent and abundant seed. The increase in alkaloids is so great as to be altogether unprecedented in the finest samples of mature American bark.

Years.	Acres Cultivated.	Yield in lbs.
1861	953,076	95,980,000
1862	985,578	84,618,800
1863	1,135,688	89,764,080
1864	1,730,630	156,619,040
1865	885,102	65,963,200
1866	1,112,677	83,696,960

The accompanying table shows the area under cotton culture in the North-west Provinces, and the estimated yield of the crop for the past six years. The confidence regained by the growers has evidently led to a reaction in the year 1866, for, though the cultivated extent be less than in 1863 and 1864, the area was greater than that in 1861 and 1862. The cultivation of the acclimatised New Orleans seed

lately imported into these Provinces, and distributed among cultivators, was not popular with the Native agriculturists, from the fact of its requiring more expenditure and attention than the indigenous article. It has nevertheless proved successful, where carefully sown, watered, and looked after.

The season of 1866-67 was generally favourable to the cotton crop in the Central Provinces, and the out-turn, both as to quantity and quality, was better than had been known for some years. The increase in the amount of land sown was 24,324 acres throughout the whole province. The recent general fall in the price of this article had more effect in contracting sowings in the Nerbudda Valley than in the Nagpore country, on account of its inferiority, as contrasted with the latter.

Years.	Acres Cultivated.
1864-65	690,198
1865-66	587,398
1866-67	611,722

Hence cotton was displaced by cereals, which ruled extraordinary high prices at the sowing season of 1866. The average yield per acre has been estimated at about 55 lbs. in the Wurdah Valley, and at about 42½ lbs. in other parts of these provinces, which estimate has been confirmed from several carefully conducted experiments. Towards the further development of the cultivation and trade of cotton in these parts, a Cotton Commissioner was appointed in September 1866, under whose guidance and instructions considerable improvement may be expected in the culture of the indigenous article. Gardens were also being established under Government officers, with the object of securing first-rate seed from pedigree cotton. It was in contemplation to extend certain portions of the Cotton Frauds Act of Bombay to these provinces.

Besides cotton, the principal produce of the Central Provinces consists of wheat, rice, millet, grain, oilseeds, sugarcane, tobacco, and opium. A Cotton Commissioner was also appointed for the Hyderabad assigned districts. The out-turn of cotton in Berar may be approximately estimated at 33,616 tons; the average price of the year was 11d. per pound; and the wealth involved in this traffic was valued at about 3,750,000*l.* While the crop in 1866 was held to be much according to the average of several preceding years, that for the season of 1867 was said to have a prospect equally good; thus it would seem that the culture of this staple, so much stimulated by the late American war, was still well maintained.

Laudable efforts have been made for the introduction of the best description of Hinghunghat seed. The people of Berar were at first shy of accepting this seed, confusing it in their minds with other foreign seed, of which they entertained no favourable impression. But this difficulty had been overcome, and many thousands of pounds of Hinghunghat seed had been distributed by the Cotton Commissioner.

The traffic to and from Khamgaon, where a market was in course of construction, will be much facilitated by the opening of a new station on the railway at Jullum, about seven miles from the town.

In British Burmah cotton is grown to a limited extent. The area cultivated fell from 110,000 to 7,000 acres in 1866-67.

The principal product of this province is undoubtedly rice, the estimated area cultivated was 1,881,202 acres, as compared with 1,563,380 acres on which revenue has been paid for rice crops in 1865-66.

Tobacco is also grown in British Burmah, but not to any great extent.

Years.	Acres cultivated.
1860-61 - -	1,060,558
1861-62 - -	977,728
1862-63 - -	1,362,438
1863-64 - -	1,824,763
1864-65 - -	1,742,078
1865-66 - -	1,516,076
1866-67 { eleven months	1,375,425

The cultivation of cotton in the Madras Presidency has decreased nearly ten per cent., but its extent was nevertheless greater than in 1862-63, or any previous year. This decrease may be said to be partly owing to the scarcity which prevailed in certain districts, and partly to the enhanced price in cereals, two causes naturally inducing cultivators to that kind of produce which would probably pay the best. At the same time, the average price had increased from $7\frac{1}{4}d.$ to $7\frac{3}{4}d.$ in 1866-67, throughout

the presidency. The districts in which the heaviest fall of price occurred were Madras, North Arcot, and Tinnevely. The export trade of this article also fell considerably.

Successful experiments have been made in Madras Presidency towards the introduction of Carolina rice, which is said to possess great advantages over the indigenous varieties of this produce, and the seed was in great request.

The season of 1866-67 had been much more favourable for the cultivation of cotton in both the northern and southern divisions of the Bombay Presidency than its predecessor, and the crops were expected to be of a superior kind in both quality and fibre.

	1865-66.	1866-67.
Acres cultivated - -	1,710,797	1,978,182
	Actual.	Estimate.
Out-turn of cleaned cotton in lbs. - -	85,595,797	116,383,876

The aggregate extent of cultivation showed an increase of 267,385 acres over that of the previous year, while the estimate of the out-turn, taken at a careful and moderate computation, exceeded by 30,788,079 lbs. the actual out-turn of 1865-66. This increase in yield would represent, at 250 rupees

the candy of 784 lbs., or about $7\frac{1}{2}d.$ a lb., a sum equal to 962,128*l.*, and the out-turn of the whole season's crop, at the same rate, would amount to upwards of 3,500,000*l.*

The average yield of exotic cotton in the northern division was, in 1865-66, about 30 lbs. per acre, and of indigenous or native cotton 60 lbs. In 1866-67 it was 70 lbs. per acre for exotic and 59 lbs. per acre for the native.

In the southern division, however, the average yield per acre of exotic cotton was 66 lbs. against 60 lbs. in 1865-66, and of 49 lbs. against 43 lbs. per acre of indigenous cotton in the respective years under review.

The extraordinary difference in the yield per acre of exotic cotton in the northern division between the two periods mentioned was attributable to the Collector of Khandeish having imported a superior seed from Berar, which, until properly acclimatized, had yielded but a small quantity, and the favourable season of 1866-67 had greatly helped to increase the average yield.

The acting Cotton Commissioner for the Bombay Presidency reports that there can be no doubt but that India is making rapid strides towards improving its cotton, and that in the past year more had happened to discourage improvement than had been the case in any one season since the commencement of the late American war drew special attention to India as a cotton producing country.

Trade.

Imports.	1865-66. Twelve Months.	1866-67, ended 31st March.	1866-67, ended 30th April.
	£	£	£
Merchandise - -	29,599,228	29,038,715	30,639,282
Treasure or bullion - -	26,557,301	13,236,904	14,598,051
Total - -	56,156,529	42,275,619	45,237,333

Bearing in mind the alteration in the date of the past official year, and in order to obtain a fair and just comparison with 1865-66, as to the actual progress or retrogression of trade, three periods are given in accompanying table, from which

it will be seen that a considerable falling off appears to have taken place in the gross import trade during the year under review, amounting to 13,880,910*l.* in the eleven months ending 31st March, and to 10,919,196*l.* to the end of April 1867.

The

The decrease is mainly in the treasure imported, amounting to 11,959,250*l.* for the twelve months ending 30th April 1867. In the merchandise imported during the same period there was an actual increase of 1,040,054*l.* over 1865-66.

The following table will show some of the principal articles in which there has

Principal Articles.	Years ended 30 April		Principal Articles.	Years ended 30 April	
	1866.	1867.		1866.	1867.
	£	£		£	£
Arms and ammunition - -	77,503	87,739	Provisions and oilman's stores	286,567	318,806
Coal and coke - - -	466,805	549,873	Salt - - - -	265,289	396,006
Cotton twist and yarn - -	1,961,144	2,636,181	Silk goods - - - -	357,380	498,718
Cotton goods - - -	11,849,214	15,189,314	Spices - - - -	137,189	303,007
Dyes of all kinds - - -	64,271	121,586	Spirits - - - -	416,592	420,729
Horses - - - -	37,071	51,869	Sugar and other saccharine matter - - - -	563,305	582,332
Machinery of all sorts - -	586,182	644,938	Tobacco, cigars, &c. - -	70,909	101,309
Malt liquors - - -	528,485	576,518	Umbrellas - - - -	65,895	73,519
Metal manufactures - - -	647,205	737,436	Woollen goods - - - -	583,132	594,102
Metals, raw	488,374	560,944			
	Iron - - - -				
	Spelter - - - -	60,866			
	Steel - - - -	24,862			
	Tin - - - -	93,231			

been an increase. Railway, telegraph, military and naval stores, which form large items in themselves in the imports of India, have not been taken into consideration, not being regarded as articles of commerce.

Of other principal articles imported during the year, the following table will best exhibit those in which there was a falling off.

Principal Articles.	Years ended 30 April		Principal Articles.	Years ended 30 April	
	1866.	1867.		1866.	1867.
	£	£		£	£
Apparel - - - -	510,352	410,588	Metals, raw { Copper - - - -	1,322,874	928,806
Beads - - - -	57,969	51,502	Lead - - - -	41,339	36,411
Books, stationery, &c. - -	375,381	307,312	Paints, colours, &c. - -	96,802	83,178
Carriages - - - -	122,115	37,106	Perfumery - - - -	32,117	28,746
Drugs, medicines, &c. - -	153,904	151,838	Porcelain and earthenware -	91,368	60,900
Fruits, nuts, and vegetables	392,446	229,660	Silk, raw - - - -	511,239	446,817
Glass-ware of all sorts - -	248,539	137,655	Tea - - - -	186,310	150,802
Gums - - - -	63,971	49,948	Timber and woods - - -	132,641	63,770
Ice - - - -	61,994	24,997	Wines and liqueurs - - -	474,344	461,254
Jewellery and precious stones, clocks, &c. - - - -	952,996	398,379			

Exports.	1865-66. Twelve Months.	1866-67, ended 31st March.	1866-67, ended 30th April.
	£	£	£
Merchandise:			
Indian produce, &c. - -	62,684,452	40,773,959	46,551,256
Foreign do. - - -	2,806,671	1,086,035	1,178,356
Total - - - -	65,491,123	41,859,994	47,729,612
Treasure or bullion - -	2,165,352	2,431,503	2,473,165
Total exports - - -	67,656,475	44,291,497	50,202,777

or nearly 23 per cent. as compared with 1865-66, and 19 per cent. when compared with 1864-65.

The decrease in exports has been principally in the articles enumerated in the following table.

Principal Articles exported.	Years ended 30 April		Principal Articles exported.	Years ended 30 April	
	1866.	1867.		1866.	1867.
	£	£		£	£
Coffee - - - -	785,102	506,093	Oils - - - -	133,859	116,209
Cotton wool - - - -	35,587,389	19,756,489	Saltpetre - - - -	605,350	336,365
Cotton goods - - - -	1,732,133	1,275,575	Spices - - - -	163,008	142,053
Drugs - - - -	90,998	63,301	Sugar and other saccharine matter - - - -	361,362	168,406
Grain rice - - - -	4,909,562	3,791,296	Timber and woods - - -	369,523	156,418
Ivory and ivory-ware - -	92,402	87,413	Wool - - - -	871,314	799,767
Jute - - - -	771,691	751,222			
Lac - - - -	305,575	169,908			

The subjoined table will show the articles in which there has been an increase.

Principal Articles exported.	Years ended 30 April		Principal Articles exported.	Years ended 30 April	
	1866.	1867.		1866.	1867.
	£.	£.		£.	£.
Dyes, including indigo - -	1,958,862	2,036,764	Seeds of all kinds - -	1,750,197	1,913,906
Grain, except rice - -	338,356	377,638	Silk, raw - -	745,352	962,861
Gums - -	20,765	23,657	Silk goods - -	88,829	100,697
Gunnies and gunny-bags - -	311,831	443,301	Tea - -	309,899	410,141
Hides and skins - -	609,803	752,891	Tobacco of all kinds - -	52,722	56,142
Opium - -	11,122,746	11,326,039			

	1865-66.		1866-67.	
	Ships.	Tons.	Ships.	Tons.
Foreign Trade:				
Entered - -	5,865	1,958,168	5,438	1,932,073
Cleared - -	6,354	2,202,300	5,864	2,000,848
Total - -	12,219	4,160,468	11,302	3,932,921
Interportal Trade - -				
Entered - -	19,005	1,737,196	13,287	1,511,216
Cleared - -	17,177	1,723,720	11,340	1,630,793
Total - -	36,182	3,460,916	24,627	3,142,009

In the number of vessels and tonnage, whether British or Foreign, engaged in the conveyance of the trade of the year, there was a decrease of 917 vessels, with a tonnage amounting to 227,547, from and to all parts, foreign to the continent of British India. Besides the number employed

in this external trade, there were 24,627 vessels, with a tonnage of 3,142,009, occupied in the coasting trade of India, being 11,555 vessels, with a tonnage of 318,907 less than in the preceding year.

The interportal trade of Calcutta, both in imports and exports, had fallen off during the past year, amounting to 1,086,414*l.* in the aggregate, and was attributable to over speculation and mercantile failures.

In British Burmah, the value of the port to port trade decreased to the extent of 918,454*l.* The rebellion of 1866 in Upper Burmah, together with the depressed state of the rice and timber markets, combined to affect the trade of these provinces.

The interportal trade of Madras increased by 281,461*l.* during the eleven months of 1866-67, as compared with the whole period of the previous year.

The decrease in the aggregate trade of the port of Bombay with other parts of India, as compared with eleven twelfths of the previous year, amounted to 2,428,233*l.*

EDUCATION.

It has been proposed by the Trustees of the Gilchrist Educational Trust to establish two annual scholarships of 100*l.* a year each, to be held by the Natives of India at the Universities of London and Edinburgh. The Government of India suggested a substitution of one scholarship of 200*l.* for two of 100*l.* each, and that the admission of candidates should be extended so that East Indian youths generally should also be eligible, and that such scholarships should be made through open competition by the Authorities of the Presidential Universities in the three Presidencies of India in rotation, and that Latin should be omitted from the prescribed subjects of examination.

The Trustees have so far modified their original intentions as to decide that as regards the question of race, all persons born in India, except those of pure European descent, may be permitted to compete; but that they adhere to their decision that two scholarships shall be competed for of 100*l.* each per annum, to be continued for five years; that the award of such scholarships must be by open competition, by examiners under direction of the Trustees; and that they decline to relinquish Latin as one of its subjects. The Trustees have also agreed to waive the requirement of graduation in favour of such candidates as are preparing for the Civil Service Examinations.

The Secretary of State for India, with a view to encourage the proposed scheme, has sanctioned the grant of 100*l.* for passage to each scholar proceeding to

to England, with a continuance of this privilege to such as may forfeit their scholarship.

The first examination has been announced for January 1869.

	Number of Institutions.		Number of Students.	
	1865-66.	1866-67.	1865-66.	1866-67.
Government colleges and schools -	295	305	23,356	22,894
Private schools, &c. receiving aid -	2,266	2,602	90,492	98,286
Private schools, &c. receiving no aid -	197	425	7,433	13,460
Total -	2,758	3,332	121,281	134,640

The principle of fee payments has been adopted in many of these schools, showing, without doubt, the demand for means of instruction. The quality of the instruction given is, however, capable of improvement.

Expenditure.	1865-66.	1866-67.
	£	£
From Imperial funds -	138,048	138,576
„ Local funds -	89,654	90,493
Total -	227,702	229,069

into account. Assuming the net charge upon public revenue to be 138,576*l.*, and the number of students at 121,180, excluding private schools receiving no aid, the cost to Government of each student's education was about 1*l.* 2*s.* 10*d.* In 1865-66 it was 1*l.* 4*s.* 3*d.*

The receipts from school fees were in 1862-63, 29,453*l.*; in 1863-64, 34,857*l.*; in 1864-65, 44,423*l.*; in 1865-66, 51,324*l.*; and in eleven months of 1866-67, 49,671*l.*; showing a gradual increase from year to year. Of the 49,671*l.*, 27,162*l.* were received by Government institutions, and 22,509*l.* by aided institutions.

The number of candidates for entrance to the University examinations showed a falling off, the reduction being attributable to the new rule by which admission to examination was made dependent on the opinion of the teacher as to the probability of the candidates passing; this check having been imposed in consequence of a large proportion of failures in previous years. The successful candidates were principally from Government institutions.

A scheme for the establishment of Night Schools for the further encouragement of Female Education was under the consideration of the Government of India. It was proposed to open 100 schools at the outset, and, if the scheme be successful, to extend the number to 500, at an average cost of 3*l.* 10*s.* for each school, the object being to impart elementary education to those of the people as may be unable to attend in the day time.

A proposition for a local compulsory education rate, having for its object the providing a special cess for maintenance of local schools, though admitted to be sound in principle, did not meet with the sanction of Government.

	Number of Institutions.		Number of Students.	
	1865-66.	1866-67.	1865-66.	1866-67.
Government colleges and schools -	3,877	3,966	125,626	134,208
Private colleges and schools under inspection -	5,322	5,313	73,022	76,494
Total -	9,199	9,279	198,648	210,702

thing has been done during the year by the establishment of a class of widows who will, after a little training, become mistresses of girls' schools lately sanctioned

The total number of Colleges and Schools under inspection of the Education Department, as given in the margin, shows an increase of 574 institutions throughout the Bengal Presidency, with a corresponding increase in the number of students of 13,359. Sixty-four additional female schools have been opened during the last year, giving instruction to 6,541 pupils, as compared with 5,569 in the previous year.

The total expenditure of the Department was estimated as shown in the margin. The amount contributed from local sources shows an increase of 839*l.* over twelve months of the previous year. The charges incurred on purely private institutions which have accepted the inspection of the Department, but receiving no pecuniary aid from Government, were not taken

In the North-west Provinces the number of Colleges and Schools under Government increased by 80, with 12,054 additional pupils. Female education has made satisfactory progress, though there has been a falling off in some districts, the cause for which has not been explained. In Ajmere and Kumaon, where the education of females was most backward, some-

North-west Provinces.

for the districts of Ajmere and Gurwhal. The Female Normal Schools were working well, though the same cannot be said of the other class of Normal Schools, as there appeared to be a difficulty in getting the schoolmasters, who are mostly married men, to leave their homes to attend to their duties; hence the progress has not been so great as might have been desired.

Of the number of Natives employed for the first time by Government in 1866, 66 per cent. were educated at Government or aided schools.

	1865-66.	1866-67.
Number of schools - -	122	184
Number of students of English - -	9,757	13,355

A very marked sign of the general progress of the people is observable in the increase in the number of students desirous of learning the English language, being nearly 3,600. This increase has, no doubt, been stimulated by the prospect of obtaining Government employment in the army, the railways, and at the bar.

The hope of creating greater interest in the schools generally has dawned in the establishment of District or Local Educational Committees, composed of influential members of the community, official and non-official, formed for the purpose of co-operating generally in the promotion of Education, under control of the Director of Public Instruction.

Expenditure	1865-66.	1866-67.
	£	£
From Imperial funds - -	78,469	77,400
„ Local funds - -	40,761	45,729
Total -	119,230	123,129

The expenditure in this Department for the past year amounted to 123,129/., and, taking the number of pupils at 210,702, as shown in previous page, the cost per head was 11s. 8d., as compared with 12s. in 1865-66.

Central
Provinces.

	1865-66.	1866-67.
Number of schools of all classes - -	1,441	1,570
Number of scholars - -	46,738	58,137
Expenditure :—	£	£
From Imperial funds - -	13,546	15,646
„ Local funds - -	20,230	23,427
Total -	33,776	39,073

Similar progress appeared to have taken place in the Central Provinces, where the number of schools has increased 8 per cent, and the scholars 19 per cent. The cost of each pupil's education was 13s. 5d., as compared with 13s. 11d. in the preceding year. An active desire has shown itself in these Provinces for English education, chiefly confined to the Mahratta districts, the number of pupils having increased from 1,526 to 1,970.

	1865-66.	1866-67.
Number of Female Schools	90	130
„ pupils - -	2,361	3,621

The number of Females Schools continued to increase. Some of these Schools at towns or cities, where native gentlemen have become patrons, were making excellent progress. The teaching consists not only of reading, writing, and cyphering, but the more practical accomplishments of sewing and knitting.

Towards the close of the year, Government sanctioned a scheme for granting scholarships to be competed for at examinations, and to be tenable for two years at a Government or aided school of a higher class.

The receipts from school fees increased from 988/ in 1865-66 to 1,394/ in 1866-67. The highest monthly fee paid was 1s., and in the majority of schools no fees above three halfpence a month have been exacted.

British Burmah.

	1865-66.	1866-67.
Number of schools - -	299	271
„ scholars - -	6,747	7,080
Expenditure - -	£5,334	£4,748

figures for 1866-67, shown in the margin. The cost of education is about 13s. 5d. per head.

The advance of Education in these Provinces was considered satisfactory, owing mainly to the exertions of Missionary bodies. A Director of Public Instruction has been appointed. There were several schools in large towns and villages, which have not been included in the

	1865-66.	1866-67.
Number of schools -	1261	1386
„ pupils -	45,056	51,118
Expenditure:—	£	£
From Imperial funds -	62,067	61,607
„ Local funds -	9,571	11,609
Total -	71,638	73,216

In 1865-66 the number of candidates examined for the matriculation examination was 555, and in the year under report 895, showing an increase of 340. This increase is attributable in a great measure to the fact of the original minimum of one fourth of the total marks obtainable in the English language being reduced to one third. The number of successful candidates was in 306, as against 229 in the previous year; of these 142 were from Government, and 164 from private Institutions.

The results of the Educational Department in the Bombay Presidency will be seen

	1865-66.	1866-67.
Number of colleges and schools -	1,397	1,754
Number of pupils on the rolls -	94,002	117,547
Average daily attendance -	69,756	89,894
Expenditure:—	£	£
From Imperial funds -	87,007	91,668
From Local funds -	84,423	60,163
Total -	171,430	151,831

in the accompanying table. The number of institutions for instruction has increased by 357; and the number of pupils on the rolls, and the daily average of attendance, exceeded that of the previous year by 23,545 and 20,138 respectively. While there was an increased expenditure of 4,661*l.* from the Imperial funds, there was a decrease from Local sources amounting to 24,260*l.* The gross expenditure showed a decrease of 19,599*l.* The cost of educating each pupil was 1*l.* 5*s.* 10*d.*, as compared with 1*l.* 16*s.* 5*d.*

during the previous year. The increase in Imperial expenditure is due mainly to an extension of grants-in-aid to private schools and buildings; and the decrease from Local sources was more apparent than actual, being due to the exclusion of private expenditure of about 20,000*l.* from the head of Local Funds, which appeared under this head in the previous year. The sum realized from school fees throughout the Presidency was 14,341*l.*, being 943*l.* in excess of the preceding year. The Inspectors of Education write very encouragingly of the Local Educational Cess, which continued to make great progress and gained popularity, so much so that numerous petitions were received from the people, for schools and school houses, indicating a desire to reap the full benefit of the money contributed by them, and the school attendance of the agricultural classes showed a corresponding increase, besides, the effect of this cess was to set a good example to Inamdars, Jagheerdars, and people of non-government villages, in creating a wish for a similar cess being levied for them.

The grant-in-aid system, on the principle of payment for results, has been considerably extended in this Presidency, and its success is spoken of in favourable terms, as tending to stimulate the managers of private schools to fresh exertion in the improvement of their pupils, and to the constant raising and keeping up of the schools; it will prevent the attention of teachers being concentrated on the best pupils to the neglect of others; it is, moreover, a liberal and yet an economical system, for no grant is made except for actual progress. There is no doubt that the system will obtain a further extension, and be productive of great good in the future.

Of female schools there were 61 Government institutions, with an average daily attendance of 1,234 scholars, and 29 private schools, with an average attendance of 1,403, of which 12 schools only received aid from Government. The amount of Imperial funds expended on female education during the past year amounted only to 34*l.*, while 421*l.* was received from Local sources, in support of the 61 Government female schools. Of the private schools 310*l.* was paid under grants-in-aid rules, on the system of payment for results. In the Northern Division of the Bombay Presidency, the female schools are almost entirely supported by private endowments, though managed by the Department of Public Instruction. In Sind there does not appear to have been any attempt at intro-

Madras.

Bombay.

ducing female education. With the view of extending education of a primary character among the Mahrattee, Gujerattee, and Canarese Districts, for the benefit of girls up to 10 and 12 years of age, the Government of India has sanctioned an annual sum of 3,000*l.* on a requisition from the Government of Bombay.

Punjab.

	1865-66.	1866-67.	
Number of institutions -	2,978	2,845	
Number of scholars on the rolls at the close of the year - - -	102,418	102,388	
Average daily number of pupils - - -	84,136	86,608	
Expenditure.	£	£	
	From Imperial revenue - -	48,407	56,265
	From Educational Cess Fund -	23,149	25,081
	From fees, &c. -	15,120	13,560
	Total - -	£86,676	£94,906

tion rose from 1*l.* 0*s.* 7*d.* to 1*l.* 1*s.* 11*d.* The decrease in the amount received from school fees, subscriptions from municipal and local funds, &c., was but nominal in consequence of the absence of certain returns.

The results of University examinations show that out of 17 candidates for the first Arts examination, only four passed, three of whom belonged to the Delhi and one to the Lahore College; and that out of 81 candidates for the entrance examination, 22 passed, of whom four belonged to private and 18 to Government institutions. Great difficulty was experienced in inducing students to complete the curriculum of college and university education, from the facility with which they obtained well-paid appointments on the slightest pretence to education. The value of a college scholarship is less than the pay received by an ordinary copyist, or under-clerk in a Government or mercantile office; and the demand for such clerks was large; hence, the number of candidates for the higher University examinations continued small.

A new rate of fees has been adopted for the Government Zillah schools, which came into effect at the close of the year under review; and a fresh arrangement had also been introduced into the Dera Ghazi Khan district, which will lead to the improvement and extension of the middle-class and inferior schools.

Hyderabad assigned districts.

	1865-66.	1866-67.
Number of schools -	35	147
Do. pupils -	1,881	6,644
Expenditure -	£	£
	3,444	8,424

vinces, it should be borne in mind that these districts were but ill supplied with the necessary appliances and machinery; hence the expenses for the year included the most simple requisites for the schools as an outfit to the undertaking.

Two High Schools have been formed, both capable of imparting an education that will enable a pupil to pass his matriculation examination at the Universities of Bombay and Poona. Graduated scholarships in the Town Schools have also been instituted. Three new school-houses have been opened during the year, the want of which was felt as a great impediment to the advancement of Education in towns.

SANITARY.

The adoption of Mr. Moule's system of dry-earth sewage has been reported to be the greatest public benefit conferred by a private individual in a matter so essential to public health. This system has been introduced throughout India at all hospitals, jails, and other public buildings, and although in its infancy, it has already worked wonders towards the improvement of conservancy arrangements

ments from what they were formerly. It does not appear to have been authoritatively adopted in the army, though it has been tried in some of the latrines of European regiments. There is no doubt, however, that its use will become more general, considering the unanimous expression of approval pronounced upon it.

A pecuniary reward of 500*l*. has been granted to the Rev. Mr. Moule by the Government of India, and sanctioned by the Secretary of State in Council.

	1865.	1866.
Total number treated - -	269,920	304,702

The total number of patients treated in the Bengal charitable hospitals and dispensaries in the Bengal Presidency amounted to 304,702 against 269,920 in 1865. The per-centage of mortality to total treated among the indoor patients was 29·42.

	1865.	1866.
Medical College Hospital -	34,551	42,076
Calcutta Native do. -	165,346	176,881
Branch Dispensaries to same - -	237,327	270,133
Calcutta Pauper and Police Hospital - - -	4,207	6,141

The accompanying table shows the number of patients treated, indoor and outdoor, during the past two years, in the principal hospitals and dispensaries in Calcutta. The number of deaths among the indoor patients of the Medical College Hospital amounted to 1,308, against 1,119 in 1865. The per-centage of deaths among Christian patients was 10·73 against 9·04, and among Native patients

30·86 against 29·90, in the preceding year. The number of deaths among the indoor patients of the Calcutta Native Hospital was 283 in 1865 and 430 in 1866, or a per-centage of 24·06 against 21·02. The proportion of deaths among patients treated in the Calcutta Pauper and Police Hospitals was less than in the preceding year, the numbers being 1,465 and 1,444 respectively. The cost and control of the Pauper and Police Hospitals have been handed over to the justices of the town, as mentioned elsewhere, under a Bill introduced into the Council of the Lieutenant Governor of Bengal. Great inconvenience having been felt from the locality of these hospitals, a different arrangement has been adopted, by which the sick poor were permanently accommodated in the building originally intended for the Sealdah Market, and the Amherst Street Hospital made available for the sick police, while the building at Entally was to be occupied by cases of cholera and other infectious diseases.

	1865.	1866.
Total number vaccinated -	152,099	194,753
Successful cases - - -	121,618	164,529

The increase in the number of vaccinations was 42,654, of which 34,294 were entirely due to increased activity in Calcutta and its suburbs. In June 1866 a notification was issued, prohibiting inoculation in certain towns and places in the country. And a new scheme

for extending vaccine operations has been submitted for the consideration of Government, its principale feature being to increase the number of operators from 20 to 60 in Calcutta, and 76 to 151 in the country districts.

The operations in the Darjeeling vaccine circle, which came into full work during the past year, show very favorably towards overcoming the prejudices of the people. Out of 12,125 persons vaccinated, 9,988 cases proved successful. The cost of each successful case was a very little over one shilling.

The attention of the Government having been called to the prevalence of small pox during the year in Chota Nagpore, Beerbhoom, Midnapore, and Pooree, it was proposed to establish a new vaccine superintendency, with head quarters at Ranchee, with the view of affording the necessary protection from this epidemic.

Much difficulty having been experienced in obtaining the required number of Native doctors for employment in jails, and in meeting the demands of the public service generally, the Government of India granted certain concessions, in anticipation of the general question of revision of salaries, by which the condition and prospects of Native doctors would be greatly improved.

The Government of India has also approved of a scheme for the construction of a small pox hospital in the suburbs of Calcutta. The building and repairs of which were to be executed at the public expense.

Considerable progress has been made in the cities and large towns of the North-west Provinces, where the municipal acts are in force, especially in those

those in which the introduction of the octroi or other municipal taxation, instead of the unpopular chowkeedaree tax, has given a sufficient amount of surplus funds. Latrines on an improved plan have been built, the dry-earth system of conservancy has been adopted, old and narrow streets have been drained, paved, widened, and lighted, and the people generally appear to appreciate the advantages they are now deriving from improved sanitation.

The appointment of a special sanitary officer for these provinces has been strongly urged upon the Government of India.

	1865-66.	1866-67.
Total number vaccinated -	166,583	203,916
Successful cases - -	125,072	161,711

The vaccine operations of the past year contrast very favourably, there having been an increase in the number of persons vaccinated of 37,333, and in the number of successful cases of 36,639. The cost per head of each successful case in these provinces was $8\frac{1}{2}d$.

An experiment is being tried, the result of which is anxiously looked for, during the present year, of enlisting, in the cause of vaccination, the services of Native practitioners, who are to receive a maintenance allowance during time of tuition, and when taught are to be supplied with the necessary implements, &c., and to be allowed to practise, charging suitable fees; they will receive a certificate of fitness, and be under the supervision of the vaccine department of the district.

	Number treated.
1865-66	513,169
1866-67	534,440

Six additional dispensaries have been established. The number of patients treated exceeded those in 1865-66 by 21,271. The average cost of treatment per patient was about $6d$. a head.

The system in force of regulating the Government donation by the amount of private subscriptions received has been found to work well. Dispensary committees now take more interest in the management, and are consequently more active in adding to the sums subscribed, since they find they can spend the surplus annual increase in the manner they may find most beneficial to the interests of the institutions under their charge.

The mortality during the past year amounted to 330,076, which was composed of 193,144 males and 136,932 females. By far the largest proportion of both sexes dying occurred under ten years of age and between the ages of 40 and 60. The per-centage of total death to population was 1.11 per cent.

Conservancy and water supply arrangements have done much to mitigate disease in cities and towns of the Central Provinces. Many of these towns can now, in respect of conservancy and rate of mortality, vie with the best cities in Northern India. Great efforts have been made towards the inculcation and the observance of sanitary rules in country towns and villages. Wherever there was a resident magistrate, there sanitation was enforced under the authority of Act V. of 1861. In the large towns and cities it was regulated by byelaws, framed under Municipal Acts XVIII. of 1864 and XV. of 1867, and in the military cantonments under Act XXII. of 1864.

Considerable improvement was consequently visible in the health of the people, from the benefits of certain measures carried out under municipal improvements.

To combat disease in these provinces there were 56 medical institutions in full working order. And in order to meet the difficulty which existed in securing trained doctors, a scheme was under the consideration of the Government of India for opening a medical school at Nagpore for the training of men of the country to

	1865.	1866.
Number of patients treated	103,983	138,969

the profession of medicine. The number of patients treated at all the dispensaries, showed an increase of 34,986 over all districts, and the average cost per case treated was $11\frac{1}{2}d$.

The operations of the Vaccine Department in Nagpore and Chindwarra districts

	1865-66.	1866-67.
Total number vaccinated -	4,767	22,367
Successful cases - -	2,666	19,584

contrast also very favourably with the previous year. In 1865-66 the proportion of successful cases was $55\frac{1}{2}$ per cent., and in 1866-67 it was $87\frac{1}{2}$ per cent.

This extraordinary increase in the number of persons vaccinated, among those who have hitherto shown great reluctance in having their children thus operated on, was mainly

mainly owing to the efforts on the part of the superintendent to overcome the prejudice of the people, and to the fact of the small-pox, which attacked some small towns, soon becoming an epidemic during the past year. It was at this time that the superintendent stepped in, and vaccinated all children who were found unprotected. In not one case was a child thus operated on attacked by the disease. The news of this immunity spread rapidly, and the inhabitants of towns and villages became at once anxious that their children should not be forgotten.

The general death rate amounted to 25·09 per 1,000 among the urban, and 12·76 among the rural population.

The state of public health in the towns of British Burmah may be stated to have been generally satisfactory, with the exception of Sandoway, where the cholera broke out and carried off many people. Dysentery and fever also appeared to have caused mortality at Rangoon; there were only 45 deaths from small-pox. At Bassein the death-rate was 55 per 1,000; this high rate was attributed to a want of proper sanitary arrangements. Public works of improvement were, however, being carried out, from which a favourable effect might be expected; but the great difficulty appeared to exist in the want of means, and the reluctance of the people in coming forward to carry out local improvements.

The total number of births, as far as could be ascertained, was 7,892 in 1865 and 7,977 in 1866, thus showing a small increase; while the deaths fell from 7,685 to 6,776 in 1866.

	1865-66.	1866-67.
Total number vaccinated -	7,418	7,870
Successful cases, - -	5,849	6,171

Number treated.	1865-66.	1866-67.
In-patients - -	2,985	2,724
Out-patients - -	19,804	18,236
Total - -	22,789	20,960

The health of the civil population during the past year has been decidedly unsatisfactory; cholera, small-pox, and epidemic fever have been prevalent in most of the districts of the Madras Presidency. Famine has also contributed to the mortality of the year, no doubt causing much of the epidemic disease witnessed.

The number of deaths, therefore, was unusually great, having been 14,636, which was in excess of the average of the previous ten years by 3,142. The greatest number was reported to have occurred during the months of July, August, and September.

	1865-66.	1866-67.
In-patients - -	23,154	16,574
Out-patients - -	254,953	223,740
Total - -	278,107	240,314

great care had to be taken in the selection of cases. The only possible explanation offered for the apparent decrease in the number of patients treated was, that the outlying population, not actually residing in the towns where the dispensaries were situated, were prostrated with fever, and from their extreme poverty were unable to resort to the dispensaries at which they had formerly applied for relief.

Notwithstanding the difficulties consequent on the unhealthiness of the year

	1865.	1866.
Number vaccinated -	191,394	194,509
Successful cases - -	159,755	168,057

The progress made in vaccine operations continued slow, in consequence of the Burmese being strongly prejudiced in favour of inoculation, the Native inoculators doing all in their power to induce the people not to have their children vaccinated.

The medical institutions were 13 in number, at which 20,960 persons were treated, against 22,789 in the previous year. The working of these dispensaries has been satisfactory. There was an increase in the amount of private subscriptions, thus showing that the benefits conferred were becoming more appreciated by the people.

The civil dispensaries continued to afford valuable aid to the destitute poor of the presidency town and at up-country stations.

With few exceptions, these dispensaries were all self-supporting; but, owing to the limited funds at the disposal of the local committees,

the results of the vaccine operations showed an increase. The average proportion of successful cases throughout the presidency was 86·38 per cent. Great interest has been evinced by the various officers of Government and by numerous independent gentlemen

gentlemen in the promotion of vaccination, towards making known generally the effects and method of the operation. The number of vaccinators employed by zemindars, municipal associations, and private individuals was steadily increasing.

Bombay.

Pending the erection of a new European General Hospital, considerable alterations and improvements have been effected in the building now in use, by the conversion of certain old barracks into wards for patients. Gas and water have also been laid on. A new hospital has been erected at Karwar, for the police; and a new civil hospital at Kaira has been sanctioned.

Twelve new dispensaries have been opened, two of which were established by the Telegraph Department on the Meckran coast.

	Number treated.
1865-66 -	284,468
1866-67 -	305,170

The total number of persons treated during the past year at the hospitals and dispensaries was 20,702 in excess of the preceding year.

The proportions of deaths to treated were as under:—

In the European General Hospital	-	-	7·26
„ Jamsetjee Jeejeebhoy	„	-	20·05
„ Civil Hospitals	-	-	3·85
„ Police	„	-	1·12
„ Jail	„	-	3·59

The Department of Public Health was in full operation during the past year in the city of Bombay, and the work of cleansing the town, and making arrangements for the prevention of the spread of any infection, has not been without benefit to the health and comfort of the people. The rate of mortality fell from 30·62 in 1864, and 35·4 in 1865 (during which the cholera was prevalent), to 20·50 in 1866.

	1865-66.	1866-67.
Total number vaccinated -	357,247	372,394

The number of persons vaccinated exceeded that of the previous year by 15,147. The per-centage of successful operations to number vaccinated was 92·89.

Punjab.

In the Punjab the number of dispensaries increased from 55 to 69 in 1866, and the patients treated from 342,277 to 377,754, the increase being most noticeable in the number of female patients. Owing to the unusual healthiness of the year the number of indoor patients decreased.

In consequence of the great success which attended the establishment of rural dispensaries in the Sealkote district, the entire expenditure of which was met by a tax of about 2d. on each house in the village, a similar system has been introduced into other districts of this province; and 29 youths, sons of Native practitioners, were being educated, at the expense of local funds and by private subscriptions, with a view to their future employment as Native doctors.

	1865.	1866.
Total cases - -	230,607	248,094
Successful cases - -	196,400	212,979

The results of vaccine operations were satisfactory. Opposition to vaccination, though occasionally met with, was steadily on the decrease. In some places the vaccinators have been hailed with pleasure. The

endeavours made, however, to persuade Native physicians to practise on their own account have not been encouraging, except at Amritsur, where very satisfactory results had been obtained. Of the 1651 operations performed by them 93·15 per cent. were successful.

The total number of deaths in the Punjab amounted to 200,691 in 1866, the per-centage to population being 1·32 as compared with 1·71 per cent. in 1865.

Hyderabad
assigned
districts.

In the Hyderabad assigned districts the past year has been providentially marked by an entire absence of cholera, which had previously appeared to have become endemic. The general health has also been certainly better than in former years. Much yet remains to be done in the way of sanitation, especially in the more rural villages. The conservancy establishments kept up in the large towns and under the eye of the Tehsildars have really done some good, and they have certainly much improved the exterior of the streets.

District officers have been instructed to employ the agency of the village headmen, accountants, and watchmen freely in insisting upon ordinary precautions being taken against the spread of infection and disease.

MUNICIPAL

MUNICIPAL.

Several city improvements were effected in the course of the past year by the extension and widening of certain streets in Calcutta, and by the construction of slaughter-houses, which were expected to be completed towards the close of 1867.

Arrangements had also been made towards raising the funds required for the execution of the drainage and water supply works of Calcutta, by opening a loan for 100,000*l.* on the security of the rates and taxes, under certain restrictions. Of this amount, 86,000*l.* had been actually raised within the year.

The amount required to be raised for the water supply works was 520,000*l.* As the corporation of Calcutta were unable to obtain this sum without a guarantee, the Government of Bengal decided on borrowing the money themselves, and lending it to the corporation, in three yearly instalments, carrying interest at 6 per cent. Out of this rate, 4 per cent., with 1 per cent. from the Imperial funds, will be set aside to pay the interest on the loan raised, and 2 per cent. will be invested as a sinking fund for the redemption of the principal amount.

At the request of the municipality of Howrah, the powers conferred on the Oriental Gas Company by Act V. of 1857 have been extended to that station.

A revised Municipal Act for Madras, to supersede Act IX. of 1865, had been submitted during the past year for the sanction of the Governor General in Council, by which the municipality might be enabled to raise loans for the execution of important public works of drainage and water supply; the municipal corporation be enlarged; and extended powers be granted to the president of the commission, in order to secure more efficient administration.

Considerable progress has been made in Bombay towards lighting the town with gas. On the 31st December 1865 there were but 220 lights, and on the same date in 1866 the number had increased to 1888, exclusive of ornamental lamps. During the past year eight Native gentlemen presented the municipality with large ornamental lamps for central positions on public roads.

A steam fire brigade, founded upon the model of the London Fire Brigade, has been established at Bombay, and had already done excellent service on several occasions.

ECCLESIASTICAL.

During the year 1866-67 two new churches have been erected at Chindwarra and Khundwa, in Nimar; and that at Hoshungabad was very near completion. Sufficient funds have been collected for a new church at Chanda, and for transforming an existing building at Nursingpore into a place of worship.

A new church, raised entirely by voluntary contributions, has been completed at Chudderghat in Secunderabad, and a church at Berhampore is now nearly finished. A similar building was also under construction at Tellicherry, to be erected from funds bequeathed for that purpose by Mr. Brennen in 1860. At the close of the year under review there were 168 clergymen in the diocese, of which 52 were Native clergymen.

Two additional churches have been constructed in the Bombay Presidency, one at Egutpoora and another at Poona. The former was built partially, and the latter entirely, at Government expense.

A Church of England Mission has been sanctioned for the penal settlement of Port Blair in the Andaman Isles.

Two new churches (at Purneah and Gya) have been completed, and those at Cachar, Arrah, and Moteeharee were very nearly so.

The monumental church at Ferozepore has been improved by the addition of a tower and spire, and the Roman Catholic chapel at Meean Meer has been re-roofed and enlarged. The church at Attock was progressing towards completion.

POSTAL.

On the 19th November 1867 negotiations were brought to a conclusion, and a contract entered into with the Peninsular and Oriental Steam Navigation Company, for the conveyance of the mails to India, China, and Japan. By this contract the Company are to find adequate vessels, with appropriate steam power, and properly equipped and manned by competent officers, including a surgeon,

on board each vessel. The speed of the vessels employed is to be at the rate of ten knots per hour on the western route between England and Alexandria, and not less than nine and a half knots on the routes east of Suez. Each vessel to sail at such days of the week and at such hours as may be directed by the Post-master General.

The subsidy to be paid by Her Majesty's Government for the performance of such service is to be 400,000*l.* a year, in equal quarterly payments, with certain provisions. Passengers will be conveyed by these vessels, the priority of accommodation being accorded to Civil, Naval, or Military Officers under Government. The rates being similar in each class.

This contract commenced on the 1st day of February 1868, and will continue in force for 12 years.

There is now a weekly service between Southampton and Alexandria, calling at Gibraltar and Malta; between Marseilles and Alexandria via Messina; between Suez and Bombay, calling at Aden; and once in every two weeks a mail will be conveyed between Suez and Calcutta, calling at Aden, Point de Galle, and Madras; also between Bombay and Hong Kong, calling at Point de Galle and Singapore; between Hong Kong and Shanghai, and between Shanghai and Yokohama, calling at Nagasaki. The return voyages will in each case be the same, but reversing the order of stoppages.

The postage of the correspondence of Officers of the Army in India has been reduced from the 1st of January of the present year to sixpence the half ounce, under instructions issued by the Commissioners of Her Majesty's Treasury.

A proposal has been submitted to transmit the correspondence of China and India with the United States by a line of packets recently established between San Francisco, Yokohama, and Hong Kong. As the arrangement may be considered advantageous to the public, it is hoped the Government of India will agree to it.

EMIGRATION.

Bengal.

	1865-66.	1866-67.
Mauritius - - -	15,115	478
British Guiana - - -	2,842	4,509
West Indies - - -	2,006	5,188
Total - - -	19,963	10,175

In last year's Report mention was made of a very large increase in the number of Emigrants from Bengal, as compared with 1864-65, and that the increase was entirely amongst those who were despatched to the Mauritius; but in 1866-67 there was a corresponding diminution in the number despatched when compared with the previous year. This decrease was among those shipped to the Mauritius, and was attributed to the high price of grain imported for the consumption of labourers at that Colony, also to the depressed state of agricultural prospects of the Island, arising from a severe drought to which it had been subject. In fact, Emigration to Mauritius on account of Government had been suspended for a time. A number of old Emigrants, however, had returned to Mauritius at their own expense; a fact which speaks for itself as to the condition and prospects of laborers in that Colony.

The proportion of female to male Emigrants still continued excessive, which is assignable to the same cause as mentioned in last year's Report, viz., the scarcity of food in the recruiting districts.

1864-65.	1865-66.	1866-67.
2,882	3,747	2,325

The total number of Emigrants returned from Mauritius and other places is shown annexed for the last three years. The mortality among those sent to Mauritius was 0.62 per cent., and 1.02 per cent. on those returning from the same Colony, and from Réunion 0.71 per cent.

In order to obviate a recurrence of the excessive mortality which prevailed among Emigrants despatched to British Guiana in 1864-65, which was also alluded to in last year's Report, and while the suggestions of the Sanitary Commission are being considered by Government in connexion with the amendment of Act XIII. of 1864, a rule had been laid down, under recommendation of this Commission, that, weather permitting, one third of the number on board shall always be on deck under awnings, and that the Director of Emigrants was to see that their clothes were carefully disinfected prior to embarkation.

A proposition was submitted to the Government of India for a more simple means of remitting the savings of Coolies to India, similar to the method already adopted

adopted at Mauritius, viz., by the grant of money orders payable in Calcutta, and the Government to provide their further transmission to the interior of India; the Colonial and Danish Governments agreeing to bear all risks of adverse exchanges.

This arrangement has been authorized by the Secretary of State in communication with the Colonial Office. Steps have been also taken to ensure an accurate registration of Emigrants, with the view of securing identification and the discovery of heirs in case of death.

The number of Coolies sent to the Tea districts of Assam, Cachar, and Sylhet was 12,487, against 44,582 sent in 1865-66; of which nearly 56 per cent. were females. The mortality was 252, or about 2 per cent. against 4.66 per cent. in the previous year. The demand for labour was limited during the months from June to December, but increased considerably during the three closing months of the year under review, attaining an average of the three preceding years.

With reference to the Cherrajoolie flogging case mentioned in last year's Report, besides the appointment of an Assistant Commissioner as a protection of labourers in Assam, Government sanctioned the establishment of a number of new subdivisions, with head quarters in the vicinity of tea plantations, with the view of increasing the Civil Administration of that part of the country.

A corresponding decrease in Emigration appears to have taken place from Madras, the number being 2,141, against 5,192 in 1865-66. In the five ships which left for Mauritius, carrying 1,853 persons, only 4 deaths occurred. This decrease was not owing to any paucity of applicants, but to the causes already assigned. The unfavourable nature of past seasons and scarcity of money, therefore, precluded the British colonists from sending for extraneous labour, and the stream of Emigration was directed therefore to the French Colonies.

Notwithstanding the dearness of food and the prevalence of sickness in Black Town, the mortality at the depôts was less than might have been expected; 21 cases occurred at the Mauritius depôt, chiefly among Emigrants from the interior; there were no deaths in the Natal depôt.

On a question arising in 1866 as to the allotted space for Emigrants in depôt, it has been decided that each Emigrant should be allowed 24 square feet, with a height of 12 feet.

The number of returned Emigrants from Mauritius was 495. No serious mortality occurred, except on board one ship, on which 15 deaths took place among 151 passengers. From an inquiry instituted, it was ascertained that the greater number were invalids and aged persons.

1864-65.	1865-66.	1866-67.
2,351	2,155	10,200

No vessels left Madras for the French Colonies; but while Emigration from the English ports for the British Colonies ceased, there was a large increase in the numbers from French ports. Of those embarked, 6,097 went from Pondicherry, 2,819 from Karikal, and 1,284 from Yanam;

2,477 were bound for Réunion, 3,889 for Guadeloupe, 2,595 for Martinique, and 1,239 for Cayenne.

The proportion of women to men despatched to the French colonies was 31 per cent.

GEOLOGICAL SURVEY.

In Bengal and Behar the systematic examination of the Coalfields has been steadily carried on. The fields lying to the south of Hazareebaugh and near Ramghur have been thoroughly revised, completed, and mapped as correctly as the defective nature of the Topographical maps admitted of. Bengal and Central Provinces.

The Bokaroh coal-field covers an area of about 220 square miles, but is not rich in valuable beds of coal, though several are of considerable thickness, and of fair quality. From the northern and western ends, a considerable amount of coal had been carted away during the last two years, for burning lime, bricks, &c. for the extensive buildings now in progress at Hazareebaugh, and at Gya the coal was raised in the rudest way from mere open quarries without any mechanical appliances. The Ramghur coal-field is much more limited in extent, and though not rich in coal, nor of the best quality, there exist many points of high interest to the geologist.

A large area near Nagpore having been represented as covered by coal-bearing rocks, preparations were consequently made for carrying on the Survey between Hazareebaugh and Raneegunge in the north, and Mumerkuntuk and Sumbul-
(156.) I

Sumbulpore in the south, a district hitherto unknown as to its geological structure. This preliminary reconnaissance will prove most important and valuable when the more detailed investigations of the Survey can be extended into these regions.

The Karunpoora or Hoharoo coal-field had been carefully examined. Its extent is not less than 500 square miles, but unfortunately very little coal exists, and none worth working, in the upper group of the Damudah series. The smelting of iron ore was carried on extensively, and there were nearly 200 furnaces at work.

The South Karunpoora field is found to be of larger extent than at first supposed. Its western boundary near Patal almost touches the Karunpoora field mentioned in previous paragraph. Igneous intrusions in this part of the Damudah valley are less than in the Bokaroh or Jherria fields to the East. Limestone occurs in subcrystalline rocks further south. The Jherria coal-field had been estimated to cover an area of about 200 square miles, and that it would yield an available supply of about 465 millions of tons of coal.

The Palamow coal-field had been commenced, and a portion carefully examined, but the examination could not be continued from the want of detailed maps of this part. Further progress in the examination of a considerable area in Maubhoom was stopped from a similar cause; operations were then diverted to a district lying west of Purulia. The mapping of a large area in the districts of Dumoh and Saugor had been completed.

Bundelcund.

The researches made in the district extending from a little west of the Sone river to beyond Kalinjer fort, tend to show the existence of two distinct series of strata of a general gneissoid character, to the younger of which belong the crystalline rocks west of the Dessau river which had been doubtfully grouped with the Bijawur series. The limestone of Heerapoor and Sorai had been identified as a part of the same series and similar to the brecciated limestones occurring to the south and west of the great Vindhyan country in the Nerbudda Valley.

Gwalior and Dholpoor.

The re-mapping of the neighbourhood of Gwalior had been completed on the larger scale of one mile to the inch, adding a further area of about 350 square miles to the north of lat. $26^{\circ} 30'$ consisting chiefly of Bundari rocks and alluvium. From a reconnaissance made to the south and west in Rajpootana, the geological structure of which country was unknown, a more accurate western limit had been obtained to the continuous trappian area of Malwa, and also to the great Vindhyan group. In places, the boundary of the same rocks with the crystalline rocks beneath them is well defined, but elsewhere, and to the northwards, it becomes intricate when in contact with non-crystalline rocks.

British Burmah.

The Survey of the year 1865-66 was confined to the country lying east of the Irrawaddy river, and north of the latitude of Prome. Gravels containing fossil-wood are abundant in the Prome district; some of the silicified trunks are 60 feet long. These gravels are supposed to be identical with the ossiferous beds of Upper Burmah, and contain a considerable quantity of a concretionary argillaceous peroxide of iron, at one time largely smelted in this district; they are nowhere disturbed, though largely denuded.

The rocks of the Eastern Yema range form a distinct group, differing entirely from those known as the Prome group. Fossil wood gravels occur in the Eastern or Toungoo side of this range.

Petroleum has been noticed at Namian, south of Prome. Iron used to be largely smelted, but it is now superseded by the English material. Tin was reported towards the frontier north of Toungoo; the ore occurs in large crystals, and the source was considered to be of some value, but there would be some difficulty in making it, on account of the proximity of the Karen Tribes.

THE CYCLONE OF 1867.

The Lower Provinces of Bengal were again visited with a severe hurricane during the night of the 1st November 1867. The storm originated apparently at some point in the south-east portion of the Bay of Bengal, the centre of which was reported to have passed to the east of Saugor Point and Calcutta, in a north-easterly direction. The greatest violence of the gale was felt at Calcutta between 1.30 and 3.30 a.m. of the 2nd November, and the injury sustained by the town was even greater than that inflicted by the cyclone on 5th October 1864, mainly owing to the occurrence of the disaster during the night.

The

The number of persons killed amounted to 1,116, of which 622 were on the river. 29,394 houses were destroyed; but of these 25,148 were thatched houses. 538 boats have been sunk; besides these, 295 boats were sunk in the canals to the east of Calcutta, of which 182 have been recovered.

The damage done to the shipping was of less severity than in October 1864; this was owing to the hurricane at its worst having swept down instead of up the river, and to the absence of a storm wave, as on the last occasion; thus the ships in port were enabled to ride out the gale, and escape much injury. Several of the vessels belonging to the Government, to the Dockyard, and to the moorings and buoys of the port, were more or less severely injured. Two Government flats had been sunk; a floating light was reported missing.

At the Emigration Depôts all the Coolies were saved, though the buildings were blown down or unroofed. A greater loss of life, however, occurred at the depôts of the Labour Transport Company, 26 Coolies having been killed by the all of the principal shed.

Beyond the city of Calcutta and its suburbs, the effects of the hurricane were most disastrous at Port Canning; here the gale was accompanied by a storm wave five feet high, which passed over the town with fearful violence. The station house, goods sheds, and railway hotel were all blown down, a great portion of the jetty was carried away, and the fresh-water tanks were salted by the storm wave. The number of casualties amounted to 90, and 500 head of cattle were destroyed. Altogether the 24 Pergunnahs suffered more severely than any other district.

In Jessore also the storm was very violent, the casualties did not exceed 100. The demolition of buildings, however, was very extensive, and caused much distress, though borne with much cheerfulness by the people.

In Nuddea the force of the gale was not so violent, and the loss of life comparatively insignificant, but the destruction of cattle was not less than 15 per cent.

Considerable damage was done to boats, houses, and trees in the Dacca division, but no loss of life was reported.

In the Chittagong and Rajshahye Divisions the gale was less severe; there was no loss of life, and the amount of injury done was inconsiderable.

In Burdwan the wind blew with great violence, but no casualties were reported.

In Cuttack Division there was heavy rain and high wind, but no injury to any extent was inflicted.

In the Cossyah and Jynteeah Hills the storm did a great deal of damage among trees of large girth, but no loss of life or destruction of houses was reported.

The damage done to the crops standing has been variously estimated; and notwithstanding the losses felt among the rice, sugar cane, and other crops, there was no fear of any general scarcity in the districts where the storm was most felt, and in some districts there was no necessity for charitable relief.

Nearly 400 tons of salt was reported to have been lost during the hurricane, within the limits of the Soonderbuns.

The measures taken for relieving the distress caused by this hurricane were carried out with promptitude and alacrity. A Relief Committee was at once appointed, and a subscription opened by the Chamber of Commerce in aid of the sufferers, the Government promising to double the amount collected by subscriptions, issued instructions to District Officers to that effect wherever local subscriptions may be raised. The part of the country where relief was most urgently demanded was to the south of Calcutta. In Port Canning great distress was felt for the want of fresh water. 1,500 gallons were taken down by the South-eastern Railway Company in every train; besides which, a steamer was sent with good water and clothing for distribution to the indigent. It is satisfactory to note that the want of food was not generally complained of, and that the grantees or owners of the Soonderbuns Lots had assisted their tenantry speedily, with due regard to their wants and necessities.

In the District of Nuddea the landlords were informed by Government that suspension of revenue would be granted to them on their showing any indulgence to their ryots, and the magistrates were authorized to employ on petty works any of the labouring classes who may be found to be in immediate want. In

Serampore remissions of certain taxes had been made by the municipality in favour of the sufferers. The remissions on account of all outstanding taxes on dwelling huts in the suburbs of Calcutta amounted to 3,000%.

Within a month of this disastrous gale the Committee of the Cyclone Relief Fund had expended 9,310%.

WEIGHTS AND MEASURES.

The question of revising the system of weights and measures in use throughout British India, having engaged the attention of the Supreme Government at various periods since the year 1837, was again revived during the past year.

In May 1863 the Madras Government drew attention to the importance of steps being taken for some reform which might, without disturbing the present nomenclatures to any great extent, bring about a uniformity in the present system of weights and measures in use in India, and assimilate it with the plan now existing in England.

The Calcutta Trades Association also proposed the appointment of a mixed commission, with a view of enquiring into the existing system, and recommended the adjustment of the same to one Imperial Standard, and that the revised system should be enforced by legislation.

Prior to dealing with this important subject, the Government of India resolved to appoint committees of well-selected persons to be held at the chief cities of each Presidency or Province of India, and ordered that the results of their labours should be duly reported to the Local Governments or administrations, for submission to the Supreme Government, with any further remarks which the local authorities might deem necessary.

In approving the decision of the Government of India, Sir Charles Wood, then Secretary of State for India, remarked, in a Despatch, dated January 1865, that it was obvious that great care and circumspection would be required in treating with a question so intimately connected with the interests and habits of the people, and requested to be fully informed upon this subject before any steps were authoritatively taken towards interfering with the present system existing in India.

Finding a great difference in the modes proposed to be adopted by those committees, on the receipt of the replies from the Local Governments and administrations, the Government of India referred the entire question to a central committee, appointed to meet at Calcutta in November 1867, towards obtaining a definite result as to the best method of carrying out so revolutionary a change.

The report of this committee, which was to be prepared within three months, is expected shortly.

In the meantime, however, a deputation from the Metric Committee of the British Association, introduced by the Earl Fortescue, waited on the Secretary of State for India, Sir Stafford Northcote, and pointed out the great inconvenience that might ensue hereafter from any revision of the Indian system of weights and measures, upon the plan proposed by the Government of Madras of assimilation with that now existing in England, while there was every probability of the English system being changed to that of the metric system, now so universally in practice in Europe and elsewhere.

A report of the representation made by this deputation was accordingly forwarded for the consideration of the Government of India, in a despatch, dated 15th February 1868, to be communicated to the central committee sitting at Calcutta, which pointed out, at the same time, that it would be better for the Committee to endeavour to establish a system more nearly approaching the best theoretical model than to adopt the English system, under the circumstances set forth; the Government was also cautioned not unduly to sacrifice practical convenience to theoretical symmetry.

FAMINE.

Allusion was made in the report for 1865-66 (page 3) to the famine which prevailed in Orissa and other parts of the Bengal Presidency; and it was mentioned that a Commission had been appointed to enquire into the causes of the famine, the conduct of the relief operations, and the measures to be adopted for preventing a recurrence of the calamity.

The report of the Commission having been laid before Parliament* at full length, it is unnecessary to enter on this occasion upon many of the points therein

* House of Commons Papers, 335 of 1867.

discussed; but it may not be amiss to repeat some of the facts and conclusions set forth by the Commission, with regard to the causes which led to the scarcity, and the precautionary measures recommended for adoption in future.

The natural cause of the famine was the premature cessation of the rains of 1865, in the middle of September, throughout the lower provinces of Bengal, and over a portion of the Madras coast. In most of the districts of Bengal, the fall of rain, though irregular and out of season, was not unusually small; but in part of Orissa the total fall was much below the average.

The increased demand for rice in Bengal of late years, partly due to exportation to other countries in Asia and Australasia, and partly to the supplies sent to other provinces of India where rice had been displaced by the cultivation of more valuable products, had tended to raise its value; and though the wages of labour have also in some degree increased, this had not been in proportion to the rise in the price of grain.

The result of the crops of 1865 throughout Bengal was, that in the eastern districts material injury was not sustained; in the central districts, there was a very serious shortness of crop, but not famine, except in a limited tract lying within the district of Nuddea, where timely and liberal measures of relief were adopted, and all considerable mortality was avoided; in the districts to the west of the Hooghly, the low-lying alluvial portions escaped with comparative impunity, but in the still more western province of Orissa, and the higher part of the western districts of Bengal, where the alluvium gives place to a laterite soil, the full extremity of famine was reached. The scarcity having also extended into Behar and the district of Benares, it was impossible for the crops of Bengal to be supplemented from that quarter.

The immediate effect of the failure of the crops was to raise prices to a height which, though not famine point in Calcutta, was really such in districts where rural cheapness of food had been hitherto combined with very low wages of labour; and the labour market being in no way relieved, the labouring and landless classes were very soon thrown out of employment, and reduced to a state of extreme destitution.

Early in the year 1866, evidence was given of this condition of the country around Balasore and Midnapore, by an outbreak of crime, in the form of plunder by gangs of men in whom hunger had destroyed all respect for property. Nor did these grain robberies diminish till the rains and the exhaustion of men and stocks caused such violent crime to subside from inanition.

In southern Orissa the pressure of extreme prices, and consequent suffering, came earlier, but the disorganisation from lawless plunder did not shew itself so soon, nor to such an extent. In this province the fall of rain, though generally sufficient for the cultivation of rice, is very precarious; and the country is extremely subject to the opposite evil of inundations, the rivers being liable to overflow to an extraordinary degree, while the storm wave of the sea occasionally proves an even more destructive enemy, sweeping over the embankments which have been raised for the protection of the low lands.

The natural difficulties of the country had not been much relieved by the artificial remedies; little had been done in the way of irrigation; the rivers were inaccessible to the ordinary class of European vessels; the only protected anchorage, False Point, is so far from any landing place and any civilized and populated part of the country, as to be of little use; while the roads are impracticable, during the rainy season, for wheeled carriages, and communication can at best be carried on only by means of pack bullocks.

The province of Orissa proper is about 200 miles long, and is divided into the three districts of Pooree, Cuttack, and Balasore, the collective area of which is stated to be 8,518 square miles. According to a return recently received from the Government of India, the population, before the famine, was estimated at 3,015,826. In addition to this territory, there is a very large hilly tract in the interior (about twice the size of that above mentioned), which is inhabited by a population partly Ooriah and partly aboriginal, and is under the management of chiefs exercising hereditary jurisdiction, in subordination to the Commissioners of the division. Nothing reliable is known respecting the number of the population of these "tributary mehals."

In all this part of India there is only one rainy season, but the crop is usually sown in such a manner as not to come to maturity all at once. For the most part, the early crop, principally grown on the higher lands, ripens in August

and September, and it bears an extremely small proportion to the late crop, which ripens in December, and on which almost the whole supply of food for the greater portion of the province depends.

When the country came into British hands at the beginning of the present century, there were many semi-independent chiefs, all of whom became British subjects; those in the hill tracts were allowed to retain their territories on the old terms, but the chiefships of the lowlands were annexed to the districts under the British Regulations, the chiefs remaining in possession of the land revenue, subject to a low quit rent, being, in fact, placed in the position of zemindars at a low permanent assessment. Some of the original zemindarees have survived to the present day, and a few have lapsed to the Government, owing to rebellion and other causes. Among these was the principal estate in Orissa, that of Khoorda, held by the representative of the ancient Rajahs of the province, whose mismanagement created a rebellion among his people, which led to his expulsion, and the estate is held in direct possession by the Government. Settlements have been made with the ryots and heads of villages, under which Khoorda had attained a prosperity unknown in any other part of the province.

In the settlement made at the time that the British took possession of the country, the usual Bengal system was followed of recognising a proprietary right in the person who dealt directly with the Government, with a general reservation of all subordinate rights. The record of rights made at the time gave great satisfaction, and the apportionment of the assessment which reserved two thirds for the Government was good according to the ideas of those days, although not equal to the liberal allotment of modern times, which gives half the assets to the zemindar for profit and expenses. There seems, however, to be doubt whether a sufficient margin was allowed, in a province so peculiarly subject to vicissitudes of seasons, to cover the risks of the most exposed estates, in the hands of poor and improvident owners. The practical result was that they were always greedy for remissions of revenue, and a constant struggle took place between the zemindars asserting extreme losses, and the Government distrusting their assertions, and generally with reason. The country enjoyed general peace and contentment, and grain was cheap and abundant; but wealth did not accumulate, wages were very low, and the condition of the people was tolerable rather than good.

Within the last few years, however, a decided improvement had occurred in the position of the agricultural classes in Orissa. Traders from the Madras presidency scoured the country to buy up grain, and an enterprising French house exported it largely by way of False Point. In consequence of the stimulus thus given to agricultural operations, the cessation of the Government manufacture of salt on the coast, which took place in 1863, did not cause the distress which might have been expected from the loss of their earnings by the persons employed in the manufacture, but the effect was, undoubtedly, to increase the class of agricultural labourers whom any derangement of the ordinary operations might throw out of employment and out of food.

As regards the dangers of inundations, the most intense calamity of that nature in the present century was that caused by the sea overflowing the coast of Balasore in 1831-2. To restrain the floods of the rivers, an extensive system of embankments had been formed, which is maintained partly by the Government and partly by the zemindars; but it was never wholly effectual in great floods, and, in the limited tracts to which these were necessarily confined, the people had become in some degree habituated to them, and general famine had not resulted. This would only arise from drought, which, in the most severe form, had not visited the people for the last two or three generations.

The crops of 1864, though considerably below the average in Pooree, were by no means bad in Cuttack, and very good in Balasore; and the amount of rice exported by sea in the year 1864-5 reached the enormous height of 30,000 tons.

In the following year the scantiness of the rainfall had brought prices in Pooree to a famine rate, even before the total failure in October. In Cuttack the prospects were good, on the whole, till the rain ceased on the 18th of September 1865; and the same may be said of the condition of Balasore.

The thirty years' settlement of the province was just expiring, and no new arrangement had been made, a state of things which tended to contract rather than extend the assessable area and cultivation.

Such was the position of affairs, very briefly stated, in which the end of the year 1865 found the province of Orissa, when it was visited by a calamity, the effects

of which were to sweep away, by starvation, and disease resulting therefrom, so many persons that the Commissioners observe that they are unable to say that the estimate one fourth of the whole population is too high, even in parts which did not suffer from the inundations of 1866.

It is not necessary in this report to enter into a minute review of the progress of the famine, or the measures adopted by the Government and its officers, and of private individuals, to relieve the sufferings of the people. It appears sufficient to mention one or two of the chief points bearing on the condition of the country during the season of distress.

As well as can be estimated, the outturn of the crop in Orissa appears to have been about half the usual quantity in the more favourably situated tracts, while in others it was very much less, the total yield being perhaps about a third of the full crop.

A table has been compiled of the prices of common rice, for each week from November 1865 to December 1866, from which it appears that for the five months from April to September the cost of food, in the best supplied markets, ranged from five to ten times the ordinary rate. In the interior of the districts food was generally not to be procured for money, and, when sold, was about 35 times the usual price. Feeding centres were established at which grain was sold, and cooked food distributed; but many of the famishing people were unable, and some were unwilling, to avail themselves of this relief.

The mortality reached its culminating point in August, during the heavy rain and storms which preceded and caused the floods. The people were then in the lowest stage of exhaustion, and the cold and wet killed them in fearful numbers. The damage to the tracts lying near the rivers in the central portions of Orissa was excessive; and, owing to the isolation caused by the floods, the rate of mortality was probably greater there during their continuance than at any other time.

In September there was some slight relief, not only by the extension of the system of supplying food, but also, in most parts of the country, from the ripening of the small early crop of rice. The mortality, however, was not lessened, inasmuch as many who had hitherto survived under the pangs of starvation died as soon as they obtained the meals to which they had long been strangers.

In the final report of the Commission on the mortality caused by the late famine in Orissa, received in February last, the number stated to have perished was 814,469, and 115,028 supposed to have emigrated or disappeared from this province, making a total loss of 929,497. The number of surviving inhabitants now left amounts to 2,086,329. The per-centage of deaths was 27·00; including emigrants, and those missing, the general per-centage amounted to 30·81, as loss of population during the famine.

In the districts where this early crop had been destroyed by floods, the loss terribly increased the prospective as well as the present sufferings of the people.

In November the new crop began to come into the market in considerable quantity, and then the general famine may be said to have come to an end. The people returned to their avocations, leaving only the very emaciated, the orphans, and the widows to be supported by gratuitous relief. There still, however, continued to be more general distress in the unfortunate tracts which had suffered a second calamity by the inundations.

Though special mention has thus been made of the progress of the famine in Orissa, the distress was almost as great in many of the other districts of Bengal, particularly in Maunbhoom, Singbhoom, and Midnapore. From the districts lying nearer to Calcutta, where the crops also failed, great numbers of the people flocked into the metropolis, attracted thither by the reports of the charity which was munificently bestowed by rich Native gentlemen. The great increase of the pauper population in the city called for special measures; a relief committee was formed; camps for the immigrants were instituted, and hospital accommodation was provided. The subscriptions received by the committee were devoted to the general relief of the famine-stricken districts, as well as to the provision for those suffering in Calcutta; and the amount of money thus received and disbursed was about 60,000*l.*, including a sum of 10,000*l.* set aside for the permanent support of the orphans.

With regard to the measures which should be adopted for the future in the province of Orissa, the Commissioners recommend that the present settlement with the zemindars should be renewed for a term of years, in preference to the

Government at once effecting a permanent settlement, the circumstances of the country being unsuited for the necessary revision. The great body of the zemindars having been proved to have failed in their duty as landlords, the Commissioners suggested that, in the cases of those estates which had been so reduced by the past calamities that neither zemindars nor ryots could at once assume their old responsibilities, they should, as the law provided, be taken for a time into the hands of the Government, subject to the usual allowance of a per-centage to the proprietors.

Till the settlement was concluded, the Irrigation Company, whose works were rapidly coming to a point which will admit of their extensive use, could not, in the opinion of the Commission, be said to have a fair field; and it was very desirable to remove all misunderstanding with reference to the revenue to be paid by the zemindars and the ryots.

With regard to the Irrigation Works, the Commissioners recommend that the Government should continue the policy of advancing money to the Company, in order that no interruption might be caused by the state of the money market.

To open the province, now completely isolated at certain seasons, the Commission advised the completion of the trunk road from Calcutta through Cuttack, the improvement of the harbour at False Point, and the prosecution of a system of roads throughout the country.

In the third portion of their report, the Commission have considered the measures which may with advantage be adopted, with the view of preventing a recurrence of such a calamity. First, as regards the promotion of agricultural improvement, they place the question of tenure of the land; and, while unable to determine whether a permanent settlement is not merely a good thing in the abstract, but so good a thing as to render it desirable to obtain it by substituting other taxes for the progressive value of the land which is surrendered, the Commissioners suggested that, in view of the great increase of private wealth which would undoubtedly arise therefrom, at the cost of the public exchequer, the proprietor of a permanently settled estate might be called on to pay a higher proportion of the assets than under the present liberal system he would have paid; and further, that the revenue payable might be expressed in grain, convertible into money according to the average of seasons, struck at intervals of 10 or 20 years. A settlement made on this system, if including, not merely the zemindar but the actual possessor of the soil, would, in the Commission's opinion, combine permanency of tenure with a prospective increase of land revenue to the State, in some degree commensurate with its claims and its necessities.

Next in importance to the tenure of the land they placed the question of improving the great arterial communications which connect the various provinces. Much had been done towards the advancement of this object by the construction of railways; and the Commissioners remarked that the maximum carrying power of these roads might be vastly increased at a comparatively small expense by doubling the lines of rails.

Their further suggestions on this point were, that all future canals should, if possible, be adapted to purposes of navigation in a greater degree than those hitherto constructed in Northern India, and that all considerable roads should be so laid out, wherever the nature of the country admits of it, as to be capable of receiving a light railway.

As regards irrigation, the Commissioners thought that more effectual aid against the effects of famine might be obtained by the cultivation of rice than of any other crop; and while they would not recommend any very general system of irrigation throughout Bengal proper, they thought that occasional deficiencies might be mitigated by increasing the rice supply of neighbouring provinces. At the same time, they advised the examination of a scheme suggested by Sir Arthur Cotton, for bringing water to some of the western districts of Bengal, by damming the Ganges at Rajmahal, and thence conducting a canal through Nuddea and Moorshedabad to Calcutta. A plan for utilising the waters of the Damoodah, on the western borders of Bengal, was also recommended to notice; as well as the possibility of constructing a system of embanked lakes throughout the undulating tracts of the west of Bengal, similar to those which exist in similar countries in Southern, Central, and Western India. The Soane river, already the subject of a great scheme, may supply means of irrigation for the south of Behar; and a careful examination is urged to ascertain what facilities are afforded by the streams on the northern frontier of that province

If these great irrigation works are to be undertaken by the Government, the Commission recommended the establishment of a general irrigation service, for the supply of officers thoroughly instructed in and devoted to that department.

They also advised that systematic efforts be made, by the study of practical meteorology, to obtain a chart of the rain-bearing currents of air, and to mark their variations, with the view of gathering early indications of peculiarities of season, and thus be enabled to make preparation for coming misfortunes.

In spite, however, of all precautions and improvements, poverty, scarcity, and famine must recur; and one of the effects of the progress of civilization will be, to diminish the number of small proprietors, and proportionally to increase the numbers of the labouring class who are dependent on regular wages, and consequently unable to resist a scarcity even when not amounting to general famine.

The Commissioners were very unwilling to interfere with the feeling of obligation, universally recognised by the wealthier Natives, of supporting their own poor; but they thought that a system of local taxation might be adopted, by which the richer persons of a neighbourhood would be made to bear the burden of local and partial famine, without having resort to the last resource, of imposing general taxation, or appealing to the general charity of the country. On the occurrence of scarcity of such a degree that the poor are unable to support themselves, the zemindars might be bound to support the poor of their estates, by supplying food in return for labour to the able-bodied who are unable to obtain employment, and by feeding gratuitously those who are unable to labour; and, in the event of their failing to do so, the officer in charge of the district might be empowered to summon a jury to decide whether the distress is such as to require relief, and to assess the amount requisite to provide the needful supplies.

The effect of such an arrangement would, according to the opinion of the Commissioners, be, that ordinary poverty would still be left to private charity; that extraordinary want, affecting considerable classes of the rural population who ordinarily support themselves, would be a charge on the land enforced by law; and that extreme famine, affecting the majority of the people, would be a charge on the general revenues of the country, and the subject of appeal to the charity of the general public. In such a case they considered that the Government should supply employment by means of public works, while the public provide the means of gratuitous relief to the helpless; and, in order that works undertaken on occasions of famine may be rendered permanently useful, designs and practical plans should always be in existence, much in advance of the immediate means of execution, but in such a form that they could be carried out in the event of an emergency throwing a large supply of labour on the hands of the Government.

The renewal of the existing settlement of Orissa for a term of twenty years was mentioned in the report (page 4) presented last year; and subsequently the period was extended to thirty years.

The measures suggested by the Commission for a permanent provision for the orphans created by the famine in Orisa, which have met with the approval of Government, are as follow:

A provision at the rate of three rupees per month for every girl up to the age of 16 and every boy till 17 years of age.

The aggregate of such amounts to be placed to the credit of their respective guardians in the names of trustees.

The Commissioner, Collector, and Civil Surgeon of the district for the time being to act in such capacity, and the trust money to be payable to the order of any two trustees.

The guardians to submit to the trustees, *once a quarter*, a statement of the number of orphans, and to receive nine rupees in advance for every child.

Any surplus arising from deaths or other causes to be at the disposal of the trustees for any charitable purpose, with preference for orphans under the care of those guardians with whom such quarterly allowances have terminated.

The Relief Committee estimated that if every child proposed to be supported were to live up to the specified ages, the cost of their maintenance would amount to nearly 40,000*l.*, while the balance in their hands was only about 25,000*l.* It is therefore proposed that this balance be invested in Government securities, or otherwise, so that the fund may, by proper investment, and by the resumption of pensions of orphans who may die, abscond, or be restored to their natural guardians, increase as to be able to meet all demands upon it, the Government of Bengal undertaking the liability of making up the balance, if any, which may eventually be required.

It was further proposed to grant a small donation to deserving boys on their attaining the age of 17, in order to facilitate their settlement in life, with a similar award to the girls on their marriage.

The operations of the Relief Fund have now been brought to a close, and no further expense will be incurred in gratuitous relief.

The harvest was also reported to be a plentiful one, and distress at an end. The stock of rice was being sold off in Cuttack at cheap rates; and all accounts are by this time closed, and the respective officers employed have been relieved of their duties.

An active movement had been commenced among the members of the Native community, with the view of restoring to caste those who have been supposed to lose it, by the imposition of a moderate penance, a measure which will be beneficial in eradicating the effects of the famine upon those who have been thus thrown on public charity, and upon the country in general.

Statistical Department,
India Office,
1 May 1868.

CHARLES C. PRINSEP

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